

This is the `quotes.tex` file as of 20120616.2238 (raw format).

Interesting developments for the Boeing Secure Network Server (SNS). Honestly don't know what to make of it. SNS, previously MLS LAN, is one of the last two surviving A1-class systems of Orange Book days (Aesec's GEMSOS is other). The NSA said, under RATings Maintenance Program (RAMP), A1 vendors would only have to recertify what updates changed. Then, upon Common Criteria, they said all B3/A1 programs must re-certify under EAL schemes. Most couldn't afford it, but Boeing is a big defense contractor.

So, first Boeing SNS was quickly certified to EAL4+. This means nothing in practice & was likely done so they could begin sales to federal govt. Everyone knew Boeing SNS would get certified higher than competing border security solutions, probably close to EAL7. The article stated EAL7 was their next target.

Source: <http://www.boeing.com/news/releases/2007/q2/...>

A number of people CV's and LinkedIn talked about building EAL7 evidence for Boeing SNS. Yet, I had to hit the Wayback Machine to pull up 2010 "In Evaluation" list to prove it for sure.

SNS going for EAL7 <http://web.archive.org/web/20100103081527/http://...>

I went to do my periodic check, as EAL7 border security is nice. Imagine how surprised I was to see it was successfully evaluated at... EAL5+. Same as more recent XTS-400. Dropped an entire assurance level, then another. ;) Well, to be fair, the + = "augmented/extra" & it has a LOT of extra's (see yourself).

Certified Products List <http://www.commoncriteriaportal.org/products/>

So, I grabbed the validation report and security target. I had an old copy of both, which were targeted at EAL4+. Now, you guys might have to take my word for this, the Boeing SNS in EAL7 evaluation didn't have a dedicated security target. I figure they would just swap EAL4+ for EAL7. Instead, the final reports have a target and completion at EAL5+, plenty lower than before. Although, admittedly, the TOE security is rated HIGH.

So, it seems that the last A1-class product going for evaluation failed to meet both EAL6 and EAL7, dropping to EAL5 Very Augmented. So, a major defense contractor can't or won't do an EAL7 guard. Is this truly the end of high robustness outside of smartcards and separation kernels? Stay tuned!

Posted by: Nick P at June 15, 2012 1:11 PM

I'm thinking I should have read the validation report before posting. Too much coffee I guess. I stand by the previous post with these two amendments.

The validation report says:

"Boeing performed a search of all public domain sources for known vulnerabilities and performed a flaw hypothesis strategy to identify potential product vulnerabilities. **No residual vulnerabilities remain in the product.**"

I checked the glossary to see if there was a definition of "residual vulnerabilities" that might be different than mine. Not seeing one, this led me to believe they are saying no vulnerabilities remain in the product. Quite a claim for a product that didn't make high assurance. Most high assurance projects in safety-critical industries don't say there are "no flaws," just unlikely to be any serious ones.

It's getting kind of deep in Common Criteria circles, if you know what I mean. ;)

Section 12 "National and international interpretations and precedent decisions"

Well, I forgot what that meant & it's irrelevant. "International" got me thinking: there's a possibility they dropped to EAL5 to make international sales easier. They no doubt spent a ton of money on this thing & want to earn it back. I've said before B3/A1 systems had export controls & presumably their equivalents EAL6/EAL7 do, too. A number of EAL5 products are available internationally. Maybe no export controls on them?

I don't want to give them an out in the event that they just didn't make the cut for EAL6-7. However, it's possible that they targeted for EAL5, augmented with the most important EAL6-7 requirements, so that they could sell to US and allies unimpeded. Honestly, I was thinking about targeting any secure products I developed at EAL5 for same reason. (Maybe certifying the first at EAL6-7 to prove our process is that good.)

Just a thought...

Posted by: Nick P at June 15, 2012 1:32 PM

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Posted by: Nick P at June 15, 2012 1:44 PM

Source: [http://www.schneier.com/blog/archives/2012/06/friday\\_squid\\_bl\\_330.html#comments](http://www.schneier.com/blog/archives/2012/06/friday_squid_bl_330.html#comments)  
retrieved 15th June 2012.

Short summary of post in other squid thread

It seems high assurance security certification is truly dead in market for anything more complicated than a kernel or data diode. Products certified high assurance under old rules (B3/A1) were ordered to undergo costly reevaluations to modern equivalents EAL 6/7.

Products surviving old market collapse were GEMSOS (A1), Boeing SNS (A1), and XTS-400 (B3). GEMSOS couldn't afford re-evaluation, BAE dropped XTS-400 to EAL5+, and SNS's EAL7 evaluation recently resulted in a very augmented EAL5 rating.

Boeing is a major defense contractor with a big budget and guaranteed contracts. The product is just a guard. They have much experience in assuring guards. They apparently see no reason to invest in an EAL6/7 rating. If big Boeing can't justify it, then is there reason anymore for American companies to produce truly secure systems? At the moment, it seems not.

Posted by: Nick P at June 15, 2012 8:34 PM

Source: [http://www.schneier.com/blog/archives/2012/06/friday\\_squid\\_bl\\_333.html#comments](http://www.schneier.com/blog/archives/2012/06/friday_squid_bl_333.html#comments)  
retrieved 15th June 2012.

Definition of residual risk (but see my weekly activity report № 245 for an expanded definition):

These residual risks or accepted risks, which remain after all feasible corrective actions have been taken...

Source: [218, p. 82].

Anything less than the 0.053" erosion seen on STS-2 was acceptable because it was within "the experience base", a phrase that reflected first-time reliance on past SRB joint flight experience as a standard for decision making... [t]his incident was not reported to Level II and Level I emphasis because it was within the experience base.

Source: [218, p. 136, emphasis in original].

... the two controversial NASA decisions that outsiders defined as deviant after the tragedy were not defined as deviant by insiders at the time the actions took place. Deviance refers to behaviour that violates the norms of some group. No behaviour is inherently deviant; rather it becomes so in relation to particular norms.

Source: [218, p. 58].

They said this air would be breathable. Get in, get out again, and no one gets hurt.

Source: Jonathan Coulton, *Redshirt*.

For engineers, a design is a hypothesis to be tested.

Source: [218, p. 109, but see note 105 on page 487, where the author is apparently quoting Petroski [162]].

The fact that Babbage's Analytical Engine was to be entirely mechanical will help us to rid ourselves of a superstition. Importance is often attached to the fact that modern digital computers are electrical, and that the nervous system also is electrical. Since Babbage's machine was not electrical, and since all digital computers are in a sense equivalent, we see that this use of electricity cannot be of theoretical importance. Of course electricity usually comes in where fast signalling is concerned, so that it is not surprising that we find it in both these connections. In the nervous system chemical phenomena are at least as important as electrical. In certain computers the storage system is mainly acoustic. The feature of using electricity is thus seen to be only a very superficial similarity. If we wish to find such similarities we should look rather for mathematical analogies of function.

Source: [215, p. 439].

No! Try not. Do, or do not. There is no try.

Source: Yoda

'From a contradiction anything follows.' (the principle of explosion)

*ex falso quodlibet*

Source: [http://pipeline.corante.com/archives/2012/06/06/how\\_not\\_to\\_do\\_science\\_education.php#comments](http://pipeline.corante.com/archives/2012/06/06/how_not_to_do_science_education.php#comments)

Many of us on the boron fuels project got involved with project proposals from time to time. We did not operate under one all-inclusive project. Each job that could be done independently of the others was a separate project within the overall high-energy-fuel project.

These project proposals had several peculiarities. For instance, each proposal was supposed to list the names and qualifications of the engineers who would be working on the project if the proposal were accepted. Considering that it was generally about 6 months before acceptance or rejection of the proposal, who was supposed to be paying these people in the meantime? For better or worse, this feature strongly favored contractors such as Olin Mathieson, who already had a pool of engineers working on similar projects.

Source: [58, p. 202].

I heard a peculiar version of the water-white problem from a salesman shortly after I got out of college. The salesman had been selling hydrochloric acid, sometimes known as muriatic acid. The industrial grade usually had a green tint caused by contamination with iron. The company that the salesman worked for improved its equipment at considerable expense and proudly began putting out water-white muriatic acid. The salesman immediately began getting complaints from customers who did not want that weak white stuff. They insisted that they wanted that strong green stuff that they used to get. So, for those customers, the salesman arranged to have a small nail dissolved in each jug shipped to them. Result: happiness.

Source: [58, p. 103].

And then I sat down and wrote a letter to the Rocket Branch in BuAer, asking that I be authorized to look into the whole business. That was early in June, 1954. I should, of course, have waited for official authorization before I did anything more, but as there didn't seem to be any particular reason to observe the legalities, we decided to get going immediately, and to make up a hundred or so pounds of each salt before anyone got around to telling us not to.

Source: [46, p. 138].

...and I could move faster than he could. My outfit was small, I didn't have to pay any attention to contracts, since I didn't have any, the brass seldom paid any attention to what I was doing, and I could usually try whatever I wanted to try before anybody in authority could get around to telling me not to. So it went like a breeze.

Source: [46, p. 161].

Read Adm. Malcolm Schoeffel, chief of the bureau, and his deputy Rear Adm. Deak Parsons backed the project but they could not get their guided missile group to give up any of its own funds. They tapped the fuze group instead, making the argument that the Sidewinder was an "intelligent fuze." McLean noted the rather thin arguments: "So our first support came from the fuze group. That wasn't too bad a stretch of the imagination because the guidance unit really did screw on in the same place that a fuze screws on."

Source: [226, pp. 41-2].

While they were learning how to run an R&D operation, Rabinow and McLean were evolving a style that later became identified with the Lockheed "Skunk Works," but actually such informal operation was typical of OSRD laboratories in World War II.<sup>24</sup> Rabinow, who has a gift for turning a phrase, over the years evolved a set of laws:

[Law] #13 I think, says that everything you do illegally, you do efficiently. This, of course, is perfectly obvious. For one thing, you do not write at all because writing on an illegal project is suicide. For another thing, you work with whatever equipment you have on hand, and of course, you do everything on your lunch hour, which starts at 8:00 in the morning and finishes at 5:00 in the evening. Another thing, when it doesn't work well and it is illegal, you drop it very quickly and kill the project. When it is legal, you carry it on to doomsday, hoping that someone else will carry it on, so that when it finally fails you won't be blamed. If an illegal project does succeed, you will be a hero, but if it fails you would like no one to know about it, so you bury it quickly. Illegal projects are very, very efficient from many points of view. We were allowed to do much of this.<sup>25</sup>

Source: [226, pp. 12–13] (notes in original).

‘You want answers, you’re in the wrong car, kid. I only have secrets.’

Source: Walter Burke, in *The Recruit* (2003).

‘Well, for the proper working of the world,’ said Lady Margolotta, ‘it is essential that ring binders are important to at least one person.’

Source: [169, p. 406].

From the table of contents of *Software Runaways* [89]:

- 2.1 Project Objectives Not Fully Specified
  - 2.1.1 Denver International Airport
  - 2.1.4 FAA AAS
- 2.2 Bad Planning and Estimating
  - 2.2.1 ON Technology
- 2.3 Technology New to the Organisation
  - 2.3.3 4GL
  - 2.3.4 Westpac
- 2.4 Inadequate/No Project Management Methodology
  - 2.4.1 IRS
  - 2.4.3 Bank of America
- 2.5 Insufficient Senior Staff on the Team
  - 2.5.2 CONFIRM (AMR, Marriott, Budget)
- 2.6 Poor Performance by Suppliers of Hardware/Software
- 2.7 Other—Performance (Efficiency) Problems
  - 2.7.1 NCR warehouse
  - 2.7.2 Lisp in MCC CAD

Source: [89, vii–viii].

There are far too few research studies of projects in progress, or projects that have concluded, or of collections of projects. The computing and software research communities, in spite of recent exhortations to change, seem little interested in its pursuit.

Source: [89, p. 244].

Science’s core goal is to develop fundamental laws that let us make accurate predictions.

Source: [66, p. 16].

Note: TBM = Tunnel Boring Machine.

*... being left underground was a common fate for many of these [TBMs]*

Any time the machine isn't going all the way through in one direction, there's not really any other choice—the cutter head is typically wider than the finished tunnel, so there's no way to get it out.

I'm pretty sure there are a pile of them sitting under the bottom of the English Channel:

Towards the completion of the undersea drives, the UK TBMs were driven steeply downwards and buried clear of the tunnel. These buried TBMs were then used to provide an electrical earth. The French TBMs then completed the tunnel and were dismantled.

—<http://en.wikipedia.org/wiki/Chunnel#Tunnelling>

That is one hell of a grounding rod.

And I think that a recent deep-level NYC subway also left at least the cutter head underground.

Ben says: 22 Apr 2012 at 4:09 am

So not only are they leaving the robots underground, they're feeding them power?

Elusis says: 23 Apr 2012 at 12:14 am

What could possibly go wrong?

'Think of it as evolution in action.'

Source: comments on blog posting 'Sitting in the park in the sun, watching videos about robots' on JWZ's blog: <http://www.jwz.org/blog/2012/04/sitting-in-the-park-in-the-sun-watching-videos-about-robots>

in principio creavit Deus caelum et terram  
terra autem erat inanis et vacua et tenebrae super faciem abyssi et spiritus Dei  
ferebatur super aquas  
dixitque Deus fiat lux et facta est lux

Source: Latin Vulgate Bible.

*Spät kommt er, doch er kommt* (he comes late, but he comes).

Source: Friedrich Schiller

Depend upon it Sir, when a man knows he is to be hanged in a fortnight, it concentrates his mind wonderfully.

Source: Samuel Johnson, 1777.

In addition to their degraded actuators, the orbiters have aging plumbing lines leading into the main engines that could prove troublesome. Years ago, routine inspections revealed cracks in the flow liners of the feed lines, which carry liquid hydrogen from the external tank to the shuttle main engines. "If they had broken off, they could have gone into the engine and caused a catastrophic failure," says Seriale-Grush.

NASA replaced the flow liners, but had no way of knowing if there were cracks higher up. While the orbiters were still flying, removing the 12-inch diameter feed lines would have cost millions of dollars, an unjustifiable expense considering there was no evidence of damage. It would be like removing a person's colon to see if there was cancer, just because the patient was getting old.

Borrowing a page from modern medicine, NASA decided to go another way. Technicians threaded borescopes into the shuttles' plumbing to look for cracks. Technicians performed these fuel-line colonoscopies regularly, searching for the tiniest signs of damage. The examinations kept the shuttles flying, held costs down, and minimized risk. *Studying the feed lines now will show just how much risk remained* [emphasis added].

Source: Freiherr [78, p. 28–29].

If your primary goal is to learn how the universe really works, and not just to get your name in the newspaper, look where others are not exploring.

Source: Nather [154].

From the end of Watson & Crick's 1953 paper on the structure of DNA:

It has not escaped our notice that the specific pairing we have postulated immediately suggests a possible copying mechanism for the genetic material.

Source: Watson and Crick [223].

... and I've concluded, after careful consideration, that this person keeping score is me.

Source: Adam Savage, at the Reason Rally, 24th March 2012. URI: <http://youtu.be/01nSuWztIrY>.

Charles Dickens used to walk around London at night; it was the secret to his creativity:

... lost in a kind of mental ventriloquism, calling up his emotions and studying them. Every night he walked a dozen miles, without which, he said, "I should just explode and perish."

Source: Klinkenborg [126].

... a 'hazard' is a substance, object or situation with a potential for an accident or damage and... a 'risk' is the likelihood that the accident or damage will occur.

Source: Kletz [125, p. 5].

The following method is described in a footnote as '... residuals from some model are consistent with a white noise error':

Examination of residuals at each stage parallels the chemical examination of the filtrate from an extraction process. When we can no longer discover any information in the residuals then we can conclude that all extractable information is in the model.

Source: Box [31, p. 6].

... indiscriminate model elaboration is in any case not a practical option because this road is endless.

Source: Box [31, p. 2].

And then there's the weirdness beyond M31: According to the more conservative cosmologists, an alien superpower—maybe a collective of Kardashev Type Three galaxy-spanning civilizations—is running a timing channel attack on the computational ultrastructure of space-time itself, trying to break through to whatever's underneath.

Source: Stross [203].

When the manager asked the programmer to keep all variables steady when an alarm sounds, did he mean that the cooling water flow should be kept steady or that the reactor temperature should be kept steady?

Source: Kletz [121, p. 155].

Requiring a man to sign a statement that he has completed a task produces very little increase in reliability as it soon becomes a perfunctory activity.

Source: Kletz [121, p. 108].

*Training* is what was missing from the RTG 1.0 CC evaluation. The writers of the ST had (some) instructions but no training:

...training gives us an understanding of our tasks and equips us to use our discretion, while instructions tell us precisely what we should and should not do; training equips us for knowledge-based behaviour while instructions equip us for rule-based behaviour. Which do we want?

While admitting that most jobs today require some knowledge-based behaviour, many managers feel that in some situations, especially those involving safety, rule-based behaviour is essential. In practice, the rules never cover every situation and people have to use their discretion. They are then blamed either for not following the rules or for sticking rigidly to the rules when they were obviously inapplicable, another example of contradictory instructions (see Section 3.5). To try to cover every situation the rules become more and more complex, until no one can understand them or find the time to read them. People may adopt the attitude that since they are going to be blamed in any case when things go wrong, it hardly matters whether they follow the rules or not.

It would be better to recognise that people have to be given some discretion, give them the necessary training, distinguish between the rules that should never (well, hardly ever) be broken and those that on occasions may be accepted that from time to time people will make the wrong decisions.

Of course, whenever possible, exceptions to safety rules should be foreseen and authorised in advance.

The results of trying to legislate for all eventualities have been described by Barbara Tuchman, writing about naval warfare in the 18th century. In the 17th century individual captains used their own tactics, and this often caused unmanageable confusion. The UK Admiralty therefore issued *Fighting Instructions*, which required ships to act in concert under the signalled order of the commanding officer and forbade action on personal initiative.

“In general, the results did make for greater efficiency in combat, though in particular instances it could cause disaster by persuading a too-submissive captain to stick by the rule when crisis in a situation could better have been met by a course determined by the particular circumstances. As deviations from the rule were always reported by some disgruntled officer and tried by a court-martial, the *Instructions* naturally reduced, if not destroyed, initiative except when a captain of strong self-confidence would act to take advantage of the unexpected. Action of this kind was not infrequent, even though no people so much as the British preferred to stay wedded to the way things had always been done before. In allowing no room for the unexpected that lies in wait in the waywardness of men, not to mention the waywardness of winds and oceans, *Fighting Instructions* was a concept of military rigidity that must forever amaze the layman.”

In 1744, after the battle of Toulon, Admiral Matthews was court-martialled and dismissed for not sticking strictly to the rules. Aware of this decision, in 1757 Admiral Byng (who had been on the bench which tried Matthews) stuck to the rules at the battle of Minorca and was court-martialled and shot for not having done his utmost to relieve the garrison of Minorca. (This produced the famous saying of Voltaire, “*Dans ce pays-ci il est bon de tuer de temps en temps un amiral pour encourager des autres.*” [“In that country they find it pays to kill an admiral from time to time to encourage the others.”]) During the American War of Independence many British officers refused to accept commands, as they were afraid of being made scapegoats if anything went wrong.



Source: Kletz [121, pp. 52–53], citing [214, pp. 165, 175, 120–128].

If you’ve made up your mind to test a theory, or you want to explain some idea, you should always decide to publish it whichever way it comes out.

Source: Richard Feynman, in his essay on ‘Cargo Cult Science’.

...the Scottish kilt was invented by an Englishman in the 18th century, and the tartan patterns, different for each clan, were invented by 19th-century manufacturers of woollen cloth. The belief that the tartans preserve an old tradition is “an hallucination sustained by economic interest.”

Source: Kletz [122, p. 186], citing Hobsbawn and Ranger [103].

Viscount Palmerston presents his humble duty to your Majesty, and with reference to your Majesty’s question upon the subjects to which Lord William Russell’s recent despatch relates, he has the honour to state: that in the Governments of the Continent, and more especially in those which have no representative Assemblies, the second class of persons in the public offices possess and exercise much more power and influence than the corresponding class of persons in this country. In England, the Ministers who are at the heads of the several departments of the State are liable any day and every day to defend themselves in Parliament; in order to do this they must be minutely acquainted with all the details of the business of their offices, and the only way of being constantly armed with such information is to conduct and direct those details themselves.

On the Continent, where Ministers of State are not liable so to be called to account for their conduct, the Ministers are tempted to leave the details of their business much more to their Under-Secretaries and to their chief clerks. Thus it happens that all the routine of business is generally managed by these subordinate agents; and to such an extent is this carried, that Viscount Palmerston believes that the Ministers for Foreign Affairs, in France, Austria, Prussia, and Russia, seldom take the trouble of writing their own despatches, except, perhaps, upon some very particular and important occasion.

Source: ‘Palmerston’s statement of 1838 to Queen Victoria’, quoted in Kletz [122, p. 140], citing Jones [115, p. 353]. The original reference is Hanham [97, p. 322], also in Benson [25, p. 120, Letter from Viscount Palmerston to Queen Victoria, 25th February 1838].

### **MYTH 53: The most valuable writings on safety are codes and standards.**

Codes and standards are certainly valuable, indeed essential, but they hardly grab our attention and get read at once. Unless we read them and act on them, they are ineffective. In contrast, accident reports do grab our attention, do get read, and often spur us into action.

...

Accident reports are not just bait to get us to read codes and standards. They tell us the important thing: what really happened.

Source: Kletz [122, pp. 110–111].

Every error is a human error because

Someone has to decide what to do.

Someone has to decide how to do it.

Someone has to do it.

Source: Kletz [122, p. 31].

All models are wrong, but some are useful.

Source: George E. P. Box [31, pp. 2–3], also in [32] and in Box and Draper [33, p. 74].

In a more realistic vein, I have considered incorporating myself and going public. Why should I work for the next thirty years to earn a small amount each year when I could go public now at thirty times earnings and get it all ‘up front’? It is common knowledge among the Harvard MBAs on Wall Street that a Harvard MBA will earn a lot of money in his lifetime. Therefore, if I went public on the projection that I would earn \$5,000 a year after expenses, with the possibility of earnings growth over time, I imagine Wall Street would buy my stock. That would give me \$150,000 to work with. I would use \$5,000 of this to pay the first annual premium on a \$150,000 officer’s liability insurance policy. Then I would issue myself a \$145,000 bonus and go off to the beach somewhere. Wall Street would sue for their investment, charging gross mismanagement, and would win. Luckily, I would be insured. Having issued myself a bonus equal to my total working capital, my corporation would quickly go bankrupt. However, I could repeat the process every two years under a different corporate name, because Wall Street forgets.

Source: Tobias [213, p. 171].

*Je n’avais pas besoin de cette hypothèse-là.*

Source: Pierre-Simon Laplace, to Napoleon.

XLIV.

Juan was taught from out the best edition,  
Expurgated by learned men, who place,  
Judiciously, from out the schoolboy’s vision,  
The grosser parts; but, fearful to deface  
Too much their modest bard by this omission,  
And pitying sore his mutilated case,  
They only add them all in an appendix,  
Which saves, in fact, the trouble of an index;

Source: Lord Byron, *Don Juan*, Canto I, stanza XLIV [136, Canto I, stanza XLIV].

Unfortunately, Jim and Spider were too upset with NSMC to pitch our product to their schools. And when we sold some schools on the phonebook idea, they essentially said they weren’t interested. In fact, after a while they threatened to sue us if we didn’t stop using their name. I wonder whether one subsidiary of a conglomerate has ever sued another?

Source: [213, p. 113].

Note: relevant to Stargardt’s clinical trial:

This latest business reminds me of the Burzynski cancer treatment stuff, in the way that definitions of “clinical trial” are stretched like rubber bands. Personally, I think that clinical trials are supposed to follow something very much like Yog’s Law in publishing (“Money flows towards the writer”). If you’re being asked to put up all kinds of money to get your book edited and published, you’re very likely being scammed. And if you’re being asked to pay thousands of dollars to be in a “clinical trial”, well...you’re being sold something. Real clinical trials reimburse their patients for time and effort, with money and/or medical care. They do not bill them for 25 long ones at the end of the dosing schedule.

Source: Derek Lowe, *In the Pipeline*, [http://pipeline.corante.com/archives/2012/03/02/stem\\_cells\\_in\\_texas\\_quite\\_the\\_business.php](http://pipeline.corante.com/archives/2012/03/02/stem_cells_in_texas_quite_the_business.php).

Do one thing every day that scares you.

Source: attributed to Eleanor Roosevelt, but that may not be true; also attributed to Mary Schmich.

A *hazard* is a substance, object or situation that can give rise to injury or damage.

A *risk* is the likelihood that an accident or damage of a particular type and severity will occur in a particular period of time or as the result of a particular action or event. It may be expressed as a frequency (the number of occurrences per year or other period of time) or as the probability that it will occur following a particular action or event.

A hazard may be serious but the risk from it may be small.

Source: Kletz [125].

If men could learn from history, what lessons it might teach us! But passion and party blind our eyes, and the light which experience gives is a lantern on the stern, which shines only on the waves behind us!

Source: Coleridge [47, p. 147].

(Around here the winner has been known to choose the loser's tattoo.)

Source: Mike Grusin, in <https://www.sparkfun.com/tutorials/319>, retrieved 28th February 2012.

In physics, the thermodynamic entropy of a macrostate (defined by specifying pressure, volume, energy, etc.) is essentially the logarithm of the number of microstates (quantum states) consistent with it; *i.e.*, the number of ways the macrostate can be realized.

Source: Jaynes [112, p. 2].

@4 - I accidentally discovered this a few weeks back when I was nursing a terrible cold. My Adderall was a more effective decongestant than any OTC medicine I tried, although I admit I didn't try pseudoephedrine. I wonder if you could make a combined Ambien/Pseudoephedrine pill to provide relief from flu symptoms while allowing the patient to sleep or if that would just exasperate Ambien's well-known side effect of making mowing the lawn in the nude at two in the morning seem like a good idea.

Source: Chris Croy, in [http://pipeline.corante.com/archives/2012/02/27/pseudoephedrine\\_made\\_easy\\_kind\\_of.php#809990](http://pipeline.corante.com/archives/2012/02/27/pseudoephedrine_made_easy_kind_of.php#809990) retrieved 28th February 2012.

Physics is by far the oldest of the quantitative sciences, and so it is hardly surprising that some of the conceptual and methodological problems arising in newer sciences have turned out to be almost identical with ones that were recognized and solved long ago in physics.

Source: Jaynes [112, p. 1].

'Does your bishop know of this?'

'Well, now, the bishop is a very busy man—'

'Really, Francis—'

'Now, now—I did write him a letter, explaining the situation as clearly as possible. One of these days I will find someone who is travelling in that direction and can carry it to him. I dislike to turn church business over to a public translator; it might be garbled.'

Source: Heinlein [100, p. 166].

... we do not know what we need to know until we know what there is to know.

Source: Kletz [120, p. 166].

An audit is a systematic examination of an activity to see if it is being carried out correctly. Safety performance should be audited as well as accounts.

Source: Kletz [120, p.96] in Section 7.4, ‘Audits and their Limitations’.

An indulgent attitude towards people who have had lapses of attention, made errors of judgement or have not always followed the rules (see later) is a price worth paying to find out what happened (see Section 5.4, page 67).

Source: Kletz [120, p. 106], advice repeated in later books [123].

In every instruction, code and standard make a note on the reason why. Add accounts of accidents which would not have occurred if the instruction, code or standard had been followed.

Source: Kletz [120, p. 21].

Never remove equipment before you know why it was installed. Never abandon a procedure before you know why it was adopted.’

Source: Kletz [120, p. 22].

Thus, as a protection against fire, if we cannot use nonflammable materials, insulation (passive) is usually better than water spray turned on automatically (active), but that is usually better than water spray turned on by people (procedural).

Source: Kletz [123, p. 208].

...our first choice should be to see if we can remove the hazard—the inherently safer approach. For example, could we use a nonflammable solvent instead of a flammable one? Even if it is impossible at the existing plant, we should note it for the future.

The second best choice is to control the hazard with protective equipment, preferably passive equipment, as it does not have to be switched on. As a last (but frequent) resort, we may have to depend on procedures. Thus, as a protection against fire, if we cannot use nonflammable materials, insulation (passive) is usually better than water spray turned on automatically (active), but that is usually better than water spray turned on by people (procedural). In some companies, however, the default action is to consider a change in procedures first, sometimes because it is cheaper but more often because it has become a custom and practice carried on unthinkingly.

Source: Kletz [123, p. 208].

Errors by managers are signposts pointing in the wrong directions.

Source: Kletz [123, p. 207].

СЛАВА! СОБЕЩКОМУ НАРОДУ ПИОНЕРУ КОСМОСА (GLORY! SOVIET PEOPLE SPACE PIONEERS)  
Lit. ‘GLORY! SOVIET PEOPLE PIONEERS SPACE’. Romanised, it’s ‘SLAVA! SOVET-SKOMU NARODU PIONERU KOSMOSA’

Source: <http://boingboing.net/2012/02/16/soviet-space-propaganda-poster.html>.

Rydell got his bag of cornflakes out of the cupboard and carefully unrolled it. About enough for a bowl. He opened the fridge and took out a plastic, snap-top, liter container with a strip of masking-tape across the side. He'd written MILK EXPERIMENT on the masking-tape with a heavy marker.

'What's that?' Hernandez asked.

'Milk.'

'Why's it say "experiment"?''

'So nobody'll drink it. I figured it out in the dorm at the Academy.'

Source: Gibson [84, pp. 75–6].

(When investigating any fire or explosion, we should always ask why it occurred when it did and not at some other time.)

Source: Kletz [123, p. 134].

[The Test of Negation] Don't include a sentence in documentation if its negation is obviously false.

Source: Bob Martin, AT&T. What this means is, if the negation is obviously false, then the original statement is obviously true; therefore, it need not be stated.

Wade Robison refers to this design as error-provocative. Since even the smallest of errors in stacking—a piece of lint, a hair—could cause the seal not to work, the design provokes problems even under the best of circumstances, with the greatest of care by the brightest and most highly trained technicians.

Source: Robison et al. [177, p. 61n].

No civilised man goes to bed the same day he wakes up.

Source: attributed to Jimmy Walker, Mayor of New York City in 1925, in Dunford and Holland [62, p. 474].

General Weilding: I have to see the Führer.

SS guard: What for?

General Weilding: I'm to be shot.

SS guard: Wait here.

Source: *Downfall*, starting at 00:31:05. It's really just a couple of short scenes before the classic parodied scene in Hitler's bunker.

*Dans les champs de l'observation le hasard ne favorise que les esprits préparés.*

Source: Louis Pasteur

"... You're a reservist, I understand. How on earth did they ever let you go?"

"I put my destroyer on a sandbar once."

"I see. You have atoned for that error, Commander." Beatie offered his hand.

Source: Clancy [44, p. 505].

February 10, 1996: first win by computer against top human.

November 21, 2005: last win by human against top computer.

Source: xkcd, <http://www.xkcd.com/1002/>, 10th January 2012.

“Nothing then is easier for a dishonest cable operator than the commission of a fraud of gigantic extent.”

Source: Bellovin [22, p. 210], citing Slater’s 1876 book.

It seems clear that Miller understood the threat he was countering: “Any system which allows a cipher word to be used twice with the same signification is open to detection. A little talk with a telegraph operator will convince one of this fact.”

Source: Bellovin [22, p. 210].

Lord Nelson’s famous signal “England expects that every man will do his duty” originally stated “England *confides* that...”. However, his signal officer immediately pointed out that “confides” was not in the codebook, and hence would be slower to send, whereas “expects” was. Nelson agreed to the change [31].

Source: Bellovin [22, p. 208] (emphasis in original; reference refers to original).

One of Miller’s codewords, GUINEAPIG, is interesting both because it shows the limitations of the code but also for what it says about authentication over the years:

Identity can be established if the party will answer that his or her mother’s maiden name is.....	} 05626 Guineapig
---	-------------------

Mother’s maiden name, that old standby “secret”, was used that way at least as early as 1882.

Source: Bellovin [22, pp. 205–206].

‘We submit that it is.’

Source: Bellovin [22, p. 210].

Religion is regarded by the common people as true, by the wise as false, and by the rulers as useful.

Source: Seneca

This connection isn’t sound. If my calculations are correct, it should be sometime around 2007 for whomever is reading this. DO NOT USE THESE CABLES. Something... happens with them. Something came through, something from somewhere else. We were overrun in days, not many of us are left. WE LIVE UNDERGROUND! ONLY YOU CAN STOP IT NOW. SAVE US. DO NOT USE THESE CABLES.

I don’t have much time. This connection isn’t sound. If my calculations are correct, it should be—

Source: Review of the Denon AKDL1 Dedicated Link Cable on Amazon.com at <http://www.amazon.com/Denon-AKDL1-Dedicated-Link-Cable/dp/B000I1X6PM> retrieved 26th December 2011.

Unfortunately, the firm didnt check the patch as well as it could have and the tweak disabled its firewalls.

Source: Bradbury [34].

Attrition is the American way in education at all levels. The whole Rube Goldberg machine leaks at every valve.

Source: Grafton [92].

when I was a child 30+ years ago, I had a book about the future, jet packs with head up displays, bountiful energy from nuclear fusion, instead we got the solar powered parking meter.

Source: Philip Clarke; [http://forums.theregister.co.uk/forum/2/2011/12/22/electronic\\_sheep/](http://forums.theregister.co.uk/forum/2/2011/12/22/electronic_sheep/).

His talent is legendary; no living person has ever seen it.

Source: me

The best advice I've found for thinking about user interfaces is by C. S. De Souza, the author of the Semiotics of Human-Computer Interaction [google.com]. She calls the interface a 'design deputy', meaning that the interface is to be seen as a message from the designer saying 'this is what I know of you and what I think will serve you best'.

Source: comment by 'overshoot' <http://apple.slashdot.org/comments.pl?sid=2568292&cid=38334404>, in article <http://apple.slashdot.org/story/11/12/11/0314240/the-condescending-ui>, retrieved 11th December 2011.

... "this situation is a massive failure of the subcontractor." It was an odd assertion, because on 15 October, one of Rodman's direct reports, Robert N. Bell, the senior vice president in charge of Black & Veatch's operations in Afghanistan, had sent an e-mail to Paul Hinks that said: "We all recognize what a great effort Symbion is making within their own management and are simply being hampered by the Afghan locals simply being unreliable and unwilling to work. All of us are 100 percent behind you and supportive of you and please do not ever think differently."

Source: Zorpette [238, p. 39].

PS If anyone from GCHQ is reading... can you email me a simple 'carry on' or 'stop wasting your time'. Need to sleep...

I am considering forging a "carry on" email as this is hugely entertaining :)

Source: comment by 'huhtenberg' on Hacker News, <http://news.ycombinator.com/item?id=3316422> retrieved 5th December 2011.

A true Irishman has so much respect for the truth that he uses it only in emergencies.

Source: [http://www.guy-sports.com/humor/saints/saint\\_patrick\\_blessing.htm](http://www.guy-sports.com/humor/saints/saint_patrick_blessing.htm).

All the reasons the F-35 was guaranteed to survive may no longer apply. Secretary Panetta himself dangled the program over the hotel balcony in his warning to Senate lawmakers about what might go away under sequestration. There are no brakes on this thing.

Source: Ewing [67].

**Columbia U:** You are sure nobody's hacking your printers?

**HP:** As I told you, it would be absolutely, totally, and in all other ways inconceivable. Out of curiosity, why do you ask?

**Columbia U:** No reason. It's only...I just happened to look at your firmware upgrade process and something is there.

Source: 'ericesque' in a comment on <http://www.engadget.com/2011/11/29/researchers-expose-printer-vulnerability/> retrieved 29th November 2011.

Yes, Russian engines used to launch American spy sats....

Mind you, Russian strategic missile subs use GPS for navigation....

Source: 'Malmesbury', in a comment on The Register, [http://forums.theregister.co.uk/forum/1/2011/11/26/nasa\\_msl\\_launch/](http://forums.theregister.co.uk/forum/1/2011/11/26/nasa_msl_launch/) retrieved 26th November 2011.

LaTeX as a service. LaaS has a nice ring to it.

Source: 'spitfire' on Hacker News <http://news.ycombinator.com/item?id=3264341> retrieved 26th November 2011.

(This is not well known, but Tony Tether, the director of DARPA, used the Grand Challenge to kick some ass in academic AI. The schools receiving funding from DARPA were told that if the private sector did better than they did, DARPA was turning off their grant money in AI. That's why the big schools put entire CS departments on the Grand Challenge.)

Source: <http://news.slashdot.org/comments.pl?sid=2536980&cid=38126216> retrieved 23rd November 2011.

I think what Anon was trying to say is that the PhD is not a vocational degree. It's actually sad how little people understand that. True, there are positions which require vocational experience, and employers will fill those positions banking on PhD applicants previous experience. However, the PhD is more than learning a set of specific skills: it is an experience which teaches a broad range of specific cognitive behaviors, many of which are extremely useful to many disciplines, not just the one on the degree. A PhD must by default be disciplined, skilled in problem solving, an excellent written communicator, and have modest experience giving presentations. STEM PhD's have to have experience with math up through linear algebra, possibly with partial differential equations, and often quite a bit more than that. They are able to think critically, organize projects, work in groups, solve problems, and moreover their degree now indicates that they have *expert level* capability in those skills. True, a pharmaceutical company isn't going to hire a philosophy major to fill a position requiring the experience of a PhD in biochemistry, but the facts are that industrial positions for specific PhD's are fairly few and far between: a lot of companies are just looking for PhD's in general. That would be the only explanation for Anon's English major friend, who I sincerely doubt was hired in the firm's "English department" before clawing his way over to financial analysis. That bloke was likely hired for his degree, and the aptitude it promises.

Source: <http://ask.slashdot.org/comments.pl?sid=2539212&cid=38139532> retrieved 22nd November 2011.

No democracy has ever declared war on another. —Proteus (2003-01-26) [well, the War of 1812 comes to mind]

Source: Craig's Cynical Quotations Page, <http://csbruce.com/quotes/cynical.html>, retrieved 20th November 2011.



It is hard to imagine a 21-year-old without a steady income securing a private or federally guaranteed loan to buy a \$150,000 house, but sums like that are still readily available for just about anyone who wants a doctor of jurisprudence degree.

Source: Segal [187].

Fun story. While I was at MIT/Sea Grant working on robot submarines, we'd lay an array of underwater beacons for navigation. To conserve power, they'd listen for a certain sequence of sounds from the sub, then reply back with their unique ping. The sub could measure the time it took to receive each unique ping, and thus determine its position by using the ping times and knowledge of where the beacons were. Kind of an underwater GPS. The beacons could last a year or more when used like this, which was a big deal because it was really annoying to locate and retrieve one just to load it with a fresh battery.

On one particular deployment, we left the beacons because we were planning to return a few months later. When we got back, the beacons weren't working. We retrieved them and all the batteries were dead. So we recharged the batteries and redeployed them. After our tests were over, we left the beacons again. When we returned a couple months later, they were all dead again.

Eventually we figured it out. The dolphins in the area had figured out the sound sequence used to make the beacons respond (probably just listened in on our sub). They thought it was pretty cool to get an acoustic response every time they used that code, so they'd been merrily chirping away during those months, draining our batteries.

Source: <http://apple.slashdot.org/comments.pl?sid=2523252&cid=38043086> retrieved 13th November 2011.

You skip to the end in chemical names—Mark Twain would have felt about them the same way he felt about the German language.

Source: Lowe [145].

*Everything you give me, Oxford*

Everything you give me, Oxford  
Canals of deep turquoise  
Lush forests of roses  
the sunlight on my window  
in the dew covered morn

Ancient and new  
both shine here together  
crumbling stones intertwined  
with midnight red cosmos

Dark fabric of scholars gowns  
fly around me  
brushing my face  
with a touch from the past

Oxford, I love you  
blue doors in brick walls  
Oxford, I love you  
Stone faces peek out  
Oxford, I love you  
Green dew on primroses  
and white clad clouds  
drift through a pink sky

as sound wafts out  
of a roadside play  
Four bells in the night  
two churches  
a school  
and the university press  
they ring through the town  
one two tree [*sic*] four  
cold and clear  
in the Oxfordshire air

Source: Miranda Kathleen Loughry, 30th October 2011.

### Irregular moment

The U.S. military’s failure to make permanent the lessons about irregular warfare during the Vietnam War are well-known. Military leaders have promised they won’t make the same mistake in the post-Iraq and Afghanistan era.

But an awkward—and rather odd—exchange during a Thursday House Armed Services Emerging Threats and Capabilities subcommittee hearing likely won’t inspire much confidence about such vows.

Subcommittee Chairman Mac Thornberry (R-Texas) asked witnesses from each of the military services whether their branches believe the U.S. military will engage in irregular warfare like that seen in Afghanistan and Iraq for years to come.

The witnesses nodded in unison—but not one uttered a single word.

The scene was a sharp contrast to the full-throated explanations service officials typically give on Capitol Hill when defending their core missions and pet hardware programs.

Source: Bennett [24].

First we take Manhattan, then we take Berlin.

Source: Leonard Cohen

The Connection Machine began as Hillis’s Ph.D. thesis at MIT. “There was a point when Danny was getting serious about the design,” recalls Minsky. “And I said to him, ‘I hope you don’t make the ILLIAC IV mistake.’ And he said, ‘Oh, what’s the ILLIAC IV mistake?’ And I told him.”

[...]

“About a month later,” Minsky recalls, “Danny came back to me and said, ‘Well, I’ve decided to make the ILLIAC IV mistake.’”

Source: Hoffman [106, pp. 203–204].

Good call. It was a knee-jerk reaction. He’s a jerk, I kneed him.

+1

\*added to personal vocabulary\*

Source: <http://thedailywtf.com/Comments/Useless-Functions,-Extreme-Naming,-and-More.aspx#365129>.

... git actually has a simple design, with stable and reasonably well-documented data structures. In fact, I'm a huge proponent of designing your code around the data, rather than the other way around, and I think it's one of the reasons git has been fairly successful [...] I will, in fact, claim that the difference between a bad programmer and a good one is whether he considers his code or his data structures more important. Bad programmers worry about the code. Good programmers worry about data structures and their relationships.

Source: Linus Torvalds, dated 27th June 2006. Message to Git mailing list. Cited in [http://en.wikiquote.org/wiki/Linus\\_Torvalds](http://en.wikiquote.org/wiki/Linus_Torvalds).

He *will* outsmart you. Knowing everything about your subject is only a first-line defense for you. It's like armor that he'll eat through in the first few minutes. He is going to have at least one deep insight about the subject, right there on the spot, and it's going to make you look like a complete buffoon.

Trust me folks, I saw this happen time and again, for *years*. Jeff Bezos has all these incredibly intelligent, experienced domain experts surrounding him at huge meetings, and on a daily basis he thinks of shit that they never saw coming. It's a guaranteed facepalm fest.

So I knew he was going to think of something that I hadn't. I didn't know what it might be, because I'd spent weeks trying to think of everything. I had reviewed the material with *dozens* of people. But it didn't matter. I knew he was going to blindside me, because that's what happens when you present to Jeff.

If you assume it's coming, then it's not going to catch you quite as off-guard.

Source: Yegge [236].

I met a traveller from an antique land  
Who said: 'Two vast and trunkless legs of stone  
Stand in the desert... Near them, on the sand,  
Half sunk, a shattered visage lies, whose frown,  
And wrinkled lip, and sneer of cold command,  
Tell that its sculptor well those passions read  
Which yet survive, stamped on these lifeless things,  
The hand that mocked them and the heart that fed.  
And on the pedestal these words appear—  
"My name is Ozymandias, king of kings:  
Look on my works, ye Mighty, and despair!"  
Nothing beside remains. Round the decay  
Of that colossal wreck, boundless and bare  
The lone and level sands stretch far away.'

Source: *OZYMANDIAS*, Percy Shelley, 1818.

But I'll argue that Accessibility is actually more important than Security because dialing Accessibility to zero means you have no product at all, whereas dialing Security to zero can still get you a reasonably successful product such as the Playstation Network.

Source: Steve Yegge [235].

You are coming to a sad realisation. Cancel or allow?

Source: <http://www.youtube.com/watch?v=RBnagZZM7so&feature=related>.

If power management on Linux could be trusted even a little bit, you might be right. Apple's power management is as close to perfect as it's ever been made. Linux power management is "we're going to give you an epidural with a lawn dart, so whatever's about to happen you might want to bite down on something... now."

Source: Mike Hoyer, in a comment on <http://www.jwz.org/blog/2011/10/has-gnome-3-decided-that-people-should#comments>.

Rules are that you must be alive when decision is announced, but can die between then and the ceremony and still get the award. That's happened to several people. What's different with Steinman is that he was dead before the announcement, but because he died so suddenly the Nobel Committee didn't realize it until after they'd proclaimed him a winner. So Steinman is getting in under what commenter Warren Terra calls a Schrodinger's cat clause: The Nobel Committee has decided that Steinman wasn't dead until somebody checked.

Source: <http://boingboing.net/2011/10/06/how-do-you-want-to-be-remembered.html> (the actual source of the quotation is in the comments on the article).

I suspect Heaven is in for one heck of a redesign.

Source: '3William56' in a comment on [http://boingboing.net/2011/10/05/steve-jobs-has-died.html#disqus\\_thread](http://boingboing.net/2011/10/05/steve-jobs-has-died.html#disqus_thread), 5th October 2011.

An Oxford D.Phil. graduate once found the gates of hell.  
He looked the devil in the eye and said, 'you're looking well'.  
The devil stared right back and said, 'Why come visit me?'  
'You've been through hell already; you got your Ph.D.'

Source: with apologies to the *MIT Drinking Song*.

No one should ever come out of a viva alone.

Source: Aimee or Roy.

'I refuse to believe that corporations are people until Texas executes one.'

Source: 'Saw this taped to the window of a vehicle in traffic today...' — 'Earth\_First' on [http://www.democraticunderground.com/discuss/duboard.php?az=view\\_all&address=439x1962067](http://www.democraticunderground.com/discuss/duboard.php?az=view_all&address=439x1962067) on 19th September 2011, from <http://boingboing.net/> today.

There is no discrete "scientific method". It's more of a mindset than a formal technique. And, it's a quest for the BEST answer, not the answer you want.

Source: 'idoubtit' [108].

**Foreman:** 'We gotta give Masters some pointers. Help her figure out how to deal with House.'

**Chase:** 'Why'd we do that? The entertainment factor is off the charts. It's like watching a bunny hop into a buzz saw. Repeatedly.'

**Foreman:** 'And if we don't help her, she's out of here.'

Source: *House*, 7th season, 'Office Politics'.

*sauve qui peut* (Fr.) 'every man for himself'.

Source:

I want hangings. Then the school must be torched and the ground laced with salt. But even that's not good enough.

Source: Jonathan Crow in a comment on <http://boingboing.net/2011/08/17/special-ed-student-was-raped-by-cl.html#more-114081>.

Controlling a huge botnet is in some ways equivalent to installing nuclear missiles. They are not in use—at the moment. Their coordinates and codes are top secret. They are just there, demonstrating power and waiting patiently for the time when their owners consider their use necessary.

Source: Rost and Glass [178, p. 185].

In a way, Conficker has an effect similar to a missile test: A country that was supposed to have no missiles suddenly launches a missile successfully. The test missile does not do any damage but falls in the ocean or in the middle of a desert. No one is hurt, nothing is destroyed. Most people don't even notice the launch of the missile. Those few who read it in the newspapers forget it after a few days. However, foreign intelligence that observes the launch on their satellite screens are on high alert.

Source: Rost and Glass [178, p. 185].

'You can argue that the UCDMO is the U.S. government's formal organizational response to the tragedy of 9/11'.

Source: Ed Hammersla, in Edwards [65].

### **The Unknown**

As we know,  
There are known knowns.  
There are things we know we know.  
We also know  
There are known unknowns.  
That is to say  
We know there are some things  
We do not know.  
But there are also unknown unknowns,  
The ones we don't know  
We don't know.

Source: U.S. Secretary of Defence Donald Rumsfeld, 12th February 2002, Department of Defense news briefing, reformatted by <http://www.slate.com/id/2081042/> [186].

...operating at the edge of chaos to get inside your adversary's OODA loop...

Source: John Boyd (fighter mafia)

The F-35 makes the basic flying task easy, and so now you have what we would call spare capacity to devote to other things, which allows the pilot to focus on the mission and the systemst task of managing the system easier.

You don't have a radar giving you a piece of data. You don't have a FLIR giving you another piece of data. You don't have a radar warning giving you yet another piece of data.

What the F-35 gives you is a fused picture of all of that, so you don't have to interpret separate data streams. For example, my Link 16 is telling me something is here, but my radar is saying its over there, and this piece is kind of telling me its over there, and this one said its a bad guy, but that one is showing it as a good guy, and on legacy aircraft you have to filter what the various systems are telling you. Now, the F-35 system is going to do a lot of that processing for you. of the airplane. The design of the airplane is intended to fuse information within the airplane

Source: SLD [195].

Two men came to my door the other day. One of them said ‘We want to talk to you about Jesus’. I said ‘Oh no, what’s he done now?’

Source: Jeff Evans

I had a great officemate, Jim, in graduate school. He took ten years to graduate, and had already been there seven years when I arrived. So, Jim knew everything about everything. He taught me an important lesson I value to this day—how to be efficient. He would sit at the next desk and admonishingly say, “Jen, I hear the sounds of repetitive keystrokes. Today you will learn Perl.”

Source: Rexford [175].

It took some lessons from an earlier IBM virtualisation project, the M44/44X, based on the pre-S/360 IBM 7000 series mainframe. The M44/44X was an attempt to implement partial virtualisation.

This was conceptually comparable to the modern open-source Xen hypervisor. On x86 CPUs without hardware virtualisation, Xen can’t trap (ie, catch and safely run) all of the instruction set without hardware assistance, so it requires guest OSs to be modified so that they don’t use the instructions Xen can’t handle.

Today, this is called paravirtualisation: guests can only use a subset of the features of the host. Back in the early 1960s, IBM’s M44 did much the same: it implemented what its developers called a “virtual machine,” the 44X, which was just that critical bit simpler than the host.

Source: Proven [170]

The CSMA/CD mechanism depends on the first bit of a packet traveling all the way across a collision domain before a station transmits the last bit of a packet so that there is a shared notion of “transmitting at the same time.” With transmission times much reduced by the higher bitrate, the physical size of collision domains already had to be reduced for Fast Ethernet, but for Gigabit Ethernet this would have to shrink to maybe 20 meters—clearly unworkable. To avoid this, Gigabit Ethernet adds a “carrier extension” that more or less pads packets to 512 bytes so that aggregate cable lengths of 200 meters remain usable.

However, as far as I know, no vendors implement the above scheme; they assume the presence of switches instead. With a switch, or with a direct cable between two computers, CSMA/CD is unnecessary: the two sides can simply both transmit at the same time. This is called full duplex operation, as opposed to half duplex for traditional CSMA/CD operation. The UTP Ethernet variants support an additional autoconfiguration protocol that allows two Ethernet systems to negotiate which speed to use, in full or half duplex mode.

Before the autonegotiation protocol was widely used, people would sometimes manually configure one system to use full duplex, but the other would use half duplex. With little traffic, this causes few problems, but as traffic increases, more and more collisions occur. These will be ignored by the system that is in full duplex mode, leading to corrupted packets that aren’t retransmitted. Autonegotiation works very reliably these days, so there is no longer any reason to turn it off and invite problems.

Source: van Beijnum [217].

They had the speculative faces of men who had seen many things, and knew that while you could of course depend on heroes, and kings, and ultimately on gods, you could *really* depend on gravity and deep water.

Source: Pratchett [168, p. 293].

This was in BoingBoing: <http://www.boingboing.net/2011/07/07/news-of-the-world-to.html#comments>

You cannot hope to bribe or twist  
(Thank God!) the British Journalist;  
Considering what the man will do  
Unbribed, you've no occasion to."

Source: Humbert Wolfe.

Another don has received a more unusual recognition. In September Mr Newman of Oriel was beatified by the Pope. I understand that one more miracle is required for full canonisation, and so I direct His Eminence's attention to the funding gap.

Source: The Public Orator's speech, Encaenia, Oxford, 2011.

**Orator:** *Honoratissime Domine Cancellarie, licetne anglice loqui?*

**Chancellor:** *Licet.*

Source: The Public Orator, Encaenia, Oxford, 2011.

If I recall correctly, a commenter some time back stated Echelon had been renamed to Facebook.

Sounded plausible to me.

Source: 'DB Cooper' in a comment on Bruce Schneier's blog, 1st July 2011. URI: [http://www.schneier.com/blog/archives/2011/07/menwith\\_hill.html#comments](http://www.schneier.com/blog/archives/2011/07/menwith_hill.html#comments) retrieved 1st July 2011.

Note: There are still companies that try & target these market segments. Boeing's SNS server was A1 & is in evaluation for EAL7. MULTOS was evaluated to ITSEC E6, an EAL7-like standard. INTEGRITY-178B was EAL6+. BAE's XTS-400/STOP line has gradually dropped from A1/EAL7(SCOMP) to B3/EAL6(XTS-200 through 400) to B2+/EAL5+ (XTS-500). The majority of high assurance certifications are data diodes, which are only so useful.

Source: 'Nick P' in [http://www.schneier.com/blog/archives/2011/06/yet\\_another\\_peo.html#comments](http://www.schneier.com/blog/archives/2011/06/yet_another_peo.html#comments) retrieved on 1st July 2011 [155].

While many complain that the DoD 8570 program was poorly implemented, and there is some truth to that, it was still the first agency-wide workforce program implemented under the FISMA requirements. Mr. Leiberman and others have ideas similar to the 8570 program on the table for the entire Federal government.

Source: 'Valiant' in a comment on [http://www.fedralsoup.com/forum\\_posts.asp?TID=34259&PN=3&title=cissp](http://www.fedralsoup.com/forum_posts.asp?TID=34259&PN=3&title=cissp) retrieved 29th June 2011 [216, p. 3].

This is normal. All production dbms instances look like buried utility lines in a city.

In enterprise software, we need 1-800-dig-safe to come and spray orange paint on stuff before we change it.

Seriously.

Source: Ollie Jones <http://thedailywtf.com/Comments/The-Key-to-a-Good-Schema.aspx>.

If a bird can't fly, it walks.

Source: [http://www.themorningnews.org/archives/the\\_non-expert/two\\_in\\_the\\_hand.php/](http://www.themorningnews.org/archives/the_non-expert/two_in_the_hand.php/) retrieved on 26th June 2011.

We put that in there eight times because nine was too many, and seven wasn't enough.

Source: Mark Cuban's lawyer, in <http://www.techdirt.com/articles/20110623/14534114832/greatest-legal-filing-ever-mark-cuban-files-photo-mavs-championship-response-to-charges-he-mismanag.shtml>.

Writing a space opera with FTL means accepting causality violation. And accepting causality violation means computing with closed timelike curves or, in simpler terms, really strong deterministic solutions to P=NP, and then some. Procedural AI hops out of the FTL hat like a demented magician's rabbit and the singularity takes a shit all over your neatly designed Napoleonics-in-Spaaaaaaace boardgame table.

Source: Charles Stross.

Imagine Joe McCarthy dragging Cabinet members into hearings and demanding that they publicly disavow the works of Groucho Marx, and you get a rough idea of the general style of Bachmannian politics.

Source: Taibbi [208].

If the layman gags at the phrasing of a question, testers reply, sometimes with a superior chuckle, this is merely a matter of "face validity." They concede that it is better if the questions seem to make sense, but they claim that the questions are not so important as the way large numbers of people have answered them over a period of time. To put it another way, if a hundred contented supervisors overwhelmingly answer a particular question in a certain way, this means something, and thus no matter whether the question is nonsensical or not, it has produced a meaningful correlation coefficient.

Source: Whyte [227, Chapter 15].

This describes the process of chosing to do a PhD: `s/executive/grad student/`.

Just when a man becomes an executive is impossible to determine, and some men never know just when the moment of self-realization comes. But there seems to be a time in a man's life—sometimes 30, sometimes as late as 45—when he feels that he has made the irrevocable self-committment. At this point he is going to feel a loneliness he never felt before. If he has had the the toughness of mind to get this far he knoes very well that there are going to be constant clashes between himself and his environment, and he knows that he must often face these clashes alone. His home life will be shorter and his wife less and less interested in the struggle. In the midst of the crowd at the office he will be isolated—no longer intimate with the people he has passed but not yet accepted by the elders he has joined.

Source: Whyte [227, p. 157].

This quotation from William Hollingsworth Whyte struck me because of the clear invocation not to misuse the common idiom of 'a return to the humanities':

... with all these qualifications an invigoration of the humanities can still make sense. It would not be a "return"; we cannot divide the U.S. into a vocationally trained majority with small group of mandarins leading them—our society is much too national, much too transient for this. If the humanities are to flourish, their relevance to everyone must be demonstrated.

Source: [227, p. 97].

William Hollingsworth Whyte on organisations:



In studying an organization, one of the most difficult things is to trace a program or innovation back to its origins, and this is just as true of organization successes as it is of failures. Who started what and when? This kind of question is the kind that makes organization people uncomfortable. ... A sense of the fitness of things requires that it be the team, everyone working together, a small part of the inexorable symmetry of the over-all plan. Repeated, time and again, it becomes official, and this is the face of organization—and the moral—that is presented to the apprentices.

Source: [227, p. 53].

This quotation might work well as an epigraph:

Men who possess significant knowledge about the world of affairs usually do not record their knowledge. The researcher who limits his studies to the printed page will often fail to gain important information.

Source: [87, p. ix].

Another great explanation from ‘fuzzyfuzzyfungus’ on Slashdot:

With RSA doing the keyfill at point of manufacture, the customer just needs to load the seed file for the entire batch onto their authentication server and then hand out the tokens, which are glued shut with considerable enthusiasm, and have no externally accessible electrical connections of any sort. If the customer did the fill, that would be extra effort (and a step where grunt manual labor would meet very sensitive data, not a pleasant HR situation...) for them, and would mean that RSA would have to validate their design against attacks on the exposed connectors.

Source: <http://yro.slashdot.org/comments.pl?sid=2218500&cid=36361840> retrieved on 7th June 2011.

I saw another at work to calcine ice into gunpowder; who likewise showed me a treatise he had written concerning the malleability of fire, which he intended to publish.

Source: Jonathan Swift, *Gulliver’s Travels*.

A professor stood before his class of 20 senior organic biology students, about to hand out the final exam. ‘I want to say that it’s been a pleasure teaching you this semester. I know you’ve all worked extremely hard and many of you are off to medical school after summer break. So that no one gets their GP messed up because they might have been celebrating a bit too much this week, anyone who would like to opt out of the final exam today will receive a “B” for the course.’

There was much rejoicing amongst the class as students got up, passed by the professor to thank him and sign out on his offer.

As the last taker left the room, the professor looked out over the handful of remaining students and asked, ‘Anyone else? This is your last chance.’ One final student rose up and took the offer.

The professor closed the door and took attendance of those students remaining. ‘I’m glad to see you believe in yourself,’ he said. ‘You all have “A”’s.’

Source: Jason King, in [http://jcdverha.home.xs4all.nl/scijokes/8\\_6.html#subindex](http://jcdverha.home.xs4all.nl/scijokes/8_6.html#subindex).

One evening I went to dinner at King’s College [Cambridge—*ed.*]—the whole high table ritual, with the cracked walnuts and the port wine and the obsequious behavior. Someone told me a story I have never forgotten. They had gotten a large bequest to the College and were trying to decide how to invest it. The bursar said, “Certainly we ought to invest it in property, real property. That has stood the college very well for the last thousand years.” But the oldest senior fellow in the room shook his head and said, “Well, that is true enough. But the last thousand years have been atypical.” [laughter]

Source: Gregory Benford, quoted in <http://www.benford-rose.com/scientistwrite.php>.

In the process of making the film, we reviewed the material every day. Now this is counter-intuitive for a lot of people. Most people—imagine this: you can’t draw very well, but even if you can draw very well, suppose you come in and you’ve got to put together animation or drawings and show it to a world-class, famous animator. Well, you don’t want to show something that is weak, or poor, so you want to hold off until you get it right. And the trick is to actually stop that behavior. We show it every day, when it’s incomplete. If everybody does it, every day, then you get over the embarrassment. And when you get over the embarrassment, you’re more creative.

As I say, that’s not obvious to people, but starting down that path helped everything we did. Show it in its incomplete form. There’s another advantage and that is, when you’re done, you’re done. That might seem silly, except a lot of people work on something and they want to hold it and want to show it, say two weeks later, to get done. Only it’s never right. So they’re not done. So you need to go through this iterative process, and the trick was to do it more frequently to change the dynamics.

Source: Ed Catmull, quoted in <http://blog.protoshare.com/2011/04/getting-over-embarrassment-and-getting-d> referencing a video at <http://5by5.tv/hypercritical/12> and the following article: [http://en.wikipedia.org/wiki/Edwin\\_Catmull](http://en.wikipedia.org/wiki/Edwin_Catmull).

Sarcasm is the protest of people who are weak.

Source: John Knowles, *A Separate Peace*.

A good hypothesis is vital in a broad inquiry, but it does not matter if the hypothesis is wrong. In many instances, you have an even better story. The test of a hypothesis is not truth, but convenience. It helps you make some order out of a wealth of material, gets you a little closer to a truth that will always remain elusive. I belabor the point because I have found that it is the one younger research people tend to get hung up on. They seek the truth too much, and so display an unconscious arrogance. They nurse specific hypotheses when they should be ruthlessly abandoning them for others. As they will learn in time, good research is a trail of busted hypotheses.

Source: Whyte [228], reprinted in LaFarge [128].

Messiness, inadvertence, paranoia, time, benign neglect. They are the soundest path.

Source: Whyte [228, p. 120].

He once wrote that “messiness, inadvertence, paranoia, time and benign neglect” were the five qualities necessary to produce a good *Fortune* article.

Source: [p. x]Whyte1956 in the Foreword by Joseph Nocera to the 2002 edition.

Motorised memory lives in the milliseconds world. Processors live in the nanoseconds world. It’s like harnessing Dobbin to the Porsche and taking it on the M25.

Source: comment by Jon Green in [http://forums.theregister.co.uk/forum/1/2011/05/21/uranium\\_smm\\_applications/](http://forums.theregister.co.uk/forum/1/2011/05/21/uranium_smm_applications/) on 22nd May 2011.

The reason that cliches become cliches is that they are the hammers and screwdrivers in the toolbox of communication.

Source: Pratchett [168, p. 146].

The following is from a movie (1966):

William Roper: So, now you give the Devil the benefit of law!

Sir Thomas More: Yes! What would you do? Cut a great road through the law to get after the Devil?

William Roper: Yes, I'd cut down every law in England to do that!

Sir Thomas More: Oh? And when the last law was down, and the Devil turned 'round on you, where would you hide, Roper, the laws all being flat? This country is planted thick with laws, from coast to coast, Man's laws, not God's! And if you cut them down—and you're just the man to do it—do you really think you could stand upright in the winds that would blow then? Yes, I'd give the Devil benefit of law, for my own safety's sake.

Source: *A Man for All Seasons*.

On safety and risk management:

He is most free from danger, who, even when safe, is on his guard.

—Publilius Syrus

Source: <http://www.b737.org.uk/pilotingquotes.htm>.

This is why I prefer to fly on Boeing aeroplanes:

From a safety standpoint, in our view one of the things that we do in the basic design is the pilot always has the ultimate authority of control. There's no computer on the airplane that he cannot override or turn off if the ultimate comes. In terms of any of our features, we don't inhibit that totally. We make it difficult, but if something in the box should behave inappropriately, the pilot can say 'This is wrong' and he can override it. That's a fundamental difference in philosophy that we have versus some of the competition.

—John Cashman, Chief Test Pilot Boeing 777

Source: <http://www.b737.org.uk/pilotingquotes.htm>. Cf. Anonymous [5] on Airbus software wonderfulness.

Unfairness:

I can recall all too many scientists and engineers whose brilliant work paid their corporations high returns long after they had ceased to have any claims on the pay roll.

Right there, I think, is some of the buncombe of our free enterprise system. Reward is supposed to be in direct proportion to production. Well, I remember the first time I ever got behind that fiction. I was visiting the Western Electric Company, which had a reputation of never cutting a piece rate. It never did; if some manufacturing process was found to pay more than seemed right for the class of labor employed on it—if, in other words, the rate-setters had misjudged—that particular part was referred back to the engineers for redesign; and then a new rate was set on the new part.

Source: Mills [150, p. 93].

On the naïveté of engineers:

These men are driven by the instinct of workmanship and by an emulative desire for recognition by their peers. They are rarely aggressive and never acquisitive. They like to work on a basis of cooperative equality and are not of the type to become executives, even minor ones.

With such characteristics they are particularly subject to exploitation.

Source: Mills [150, p. 92].

More on the naïveté of engineers:

Labor, in its cap and overalls, bargains and fights; the upper levels of business twist and shift for profitable positions; but the scientific take what is handed to them, like wards of industry, instead of its chief benefactors.

Source: Mills [150, pp. 127–8].

Cf. the essay at the beginning of Stross’s *The Atrocity Archives* [202] about sentences that could only have been written by one particular author; I think this is a characteristically DFW sentence:

I can’t imagine what trying to maneuver one of these puppies into the pier is like. Parallel parking a semi into a spot the same size as the semi with a blindfold on and four tabs of LSD in you might come close.

Source: Wallace [221, p. 50].

‘...with something akin to an apology.’

Not like the Russians. When some of their people had been kidnapped in Lebanon, the KGB’s First Directorate men had snatched their own hostages off the street and returned them—one version said headless, another with more intimate parts removed—immediately after which the missing Russians had been returned with something akin to an apology.

Source: Clancy [45].

Soon I began to see writing this book as a simple act of decency, like going back to the last calm bend in the river and nailing up a sign that reads, “Waterfall Ahead.”

Source: Robinson [176, p. 4].

Laski on experts:

He is an invaluable servant and an impossible master.

Source: [131, p.106].

One of my life’s accomplishments is to have got this quotation into the archival literature:

“The [IBM] 360 had walls of lights; in fact, the Model 75 had so many that the early serial number machines would blow the console power supply if the ‘Lamp Test’ button was pressed.” [Morris 1996]

Source: Loughry and Umphress [139, p. 265].

So let me get this straight—when jwz says “help me lazyweb” and “please don’t suggest stupid fucking things” he gets useless stupid fucking things; when he doesn’t ask, he gets well-informed psychic debugging and detailed troubleshooting guides.

Correct. I have observed that when he asks for help, fail ensues. When he claims it cannot be done, people do free engineering research.

That’s always been the way of the Lazyweb. Ask how to do something and you’ll either get a hundred useless answers or silence. Claim it can’t be done and you’ll get a “yes it can dumbass, see this detailed PDF” back in three hours.

—Chris

Source: <http://www.jwz.org/blog/2010/09/this-is-not-really-going-according-to-plan/>.

Who ordered that?

Source: I. I. Rabi, regarding the discovery of the muon  $\mu^-$ .

The great advantages of simulation and dissimulation are three. First, to lay asleep opposition, and to surprise. For where a mans intentions are published, it is an alarum, to call up all that are against them. The second is, to reserve to a mans self a fair retreat. For if a man engage himself by a manifest declaration, he must go through or take a fall. The third is, the better to discover the mind of another. For to him that opens himself, men will hardly show themselves adverse; but will fair let him go on, and turn their freedom of speech, to freedom of thought. And therefore it is a good shrewd proverb of the Spaniard, Tell a lie and find a troth.

Source: Bacon [16], but the year is not known. Quoted in Dalton [54, p. 93n31].

...statistically, your chances of winning the lotto are not measurably improved by buying a lottery ticket.

Source: Doctorow [61].

Ford Prefect:

...decided he quite liked human beings after all, but he always remained desperately worried about the terrible number of things they didn't know about.

Source: Adams [2]. This is how I feel when a computer user complains that the spelling checker is marking all the words in a Spanish quotation wrong. Learn how to use the software!

Home and to my office, and there very late with Sir W. Warren upon very serious discourse, telling him how matters passed to-day, and in the close he and I did fall to talk very openly of the business of this office, and (if I was not a little too open to tell him my interest, which is my fault) he did give me most admirable advice, and such as do speak him a most able and worthy man, and understanding seven times more than ever I thought to be in him. He did particularly run over every one of the officers and commanders, and shewed me how I had reason to mistrust every one of them, either for their falsenesse or their over-great power, being too high to fasten a real friendship in, and did give me a common but a most excellent saying to observe in all my life. He did give it in rhyme, but the sense was this, that a man should treat every friend in his discourse and opening his mind to him as of one that may hereafter be his foe.

Source: Pepys [160], referenced in Dalton [53, p. 95n42].

When you have satisfied yourself that the theorem is true, you start proving it.

Source: Polya, quoted in Dalton [53, p. 58].

'Introverts almost never cause me trouble and are usually much better at what they do than extroverts. Extroverts are too busy slapping one another on the back, team building, and making fun of introverts to get much done...I can pass for normal most of the time, but I understand perfectly why some of my autistic patients scream and flap their arms—it's to frighten off extroverts.'

Source: Mark Vonnegut, MD

... all rockets destined for orbit will pass over large swathes of the earth's surface during the 10 minutes or so that their engines are burning. This produces regulatory and legal complications that go deep into the realm of the absurd.

Source: Stephenson [201].

What I do remember is that I got all the students interested in the question and, between us, with me asking a lot of questions, and applying the results to succeeding cases, we ended up defining a crock as a patient who had multiple complaints but no discernible physical pathology. That definition was robust, and held up under many further tests.

Source: Becker [20].

What they wanted to learn, students said, was a certain kind of knowledge which could not be learned from books. They studied their books dutifully, preparing for the quizzes that punctuated rounds and other such events, but believed that the most important knowledge they would acquire in school was not in those books. What was most worth learning was what my colleagues and I eventually summarized as “clinical experience,” the sights, sounds and smells of disease in a living person: what a heart murmur really sounded like when you had your stethoscope against a patient’s chest as opposed to its sound on a recording, how patients whose hearts sounded that way looked and talked about how they felt, what a diabetic or a person who had just suffered a heart attack looked like.

You could only learn those things from people who had real physical pathologies. You learn nothing about cardiac disease from a patient who is sure he’s having heart attacks every day but has no murmurs to listen to, no unusual EKG findings, no heart disease. So crocks disappointed students by having no pathology you could observe first hand. That showed me an important and characteristic feature of contemporary medical practice: the preference for personal experience over scientific publications as a source of the wisdom you used in guiding your practice. We eventually called this the “clinical experience” perspective and found its traces everywhere.

Source: *ibid.*

Big Safari is a special Air Force acquisition program that manages sustainment and modification of special mission aircraft like the armed Predator, RC-135W RIVET JOINT signals intelligence aircraft and EC-130 COMPASS CALL electronic attack aircraft. It is credited with 60 years of success through long-service employees, quick reaction capability and focus on the “80% solution now.”

The F-117 had a streamlined management process that allowed for the aircraft to be fielded within 31 months of a full-scale development decision. The program allowed breakthrough stealth technology to be applied concurrently with the development, production and rapid fielding of the aircraft. A cross-functional integrated team was empowered to make decisions on the spot. A radar for the aircraft was left out to keep it from slowing down its operational debut.

Source: Fulghum [80].

The USAF’s development effort on the GBU-28 is an excellent case study in successful teamwork between an air force and its supporting contractors. Several important points must be stressed. The end result was produced by all players being wholly focussed upon the task at hand. A parallel development strategy was used, so that multiple alternatives were made available at every step in the process. Importantly, the bureaucracy was excluded from the process and the paperwork was treated as a post-event follow-up, rather than the immovable obstruction which it can become in many organisations. The effort was conducted wholly by operators and engineers, and the USAF hierarchy provided the proper support required to push the process through.

While the program was high risk by any standards, it also involved controlled or measured risks at every step of the process. Experts were allowed to do their thing with minimal oversight from paper pushers. Indeed this was the recipe behind the successes of Lockheed’s Skunk Works, and most other technically innovative organisations. The fundamental truth is that a preoccupation with minimising risk is not compatible with fast and cheap development work (this the author can state from personal experience managing and leading an R&D

office). Such preoccupation is endemic amongst non-technical or semi-technical managers. The GBU-28 project is a shining example of what can be achieved by a focussed effort, good technical skills and clever risk management.

Source: Kopp [127].

That's what they trained him to say. *They*. Right after they sucked his soul out through his ears and replaced it with a barcoded GPS transmitter chip implanted.

Source: me

*noli me tangere* ('touch me not')

Col. Burton on Testing:

Testing is the only way to determine the validity of the theories and promises that came from the technical community. If conducted properly, testing provides a natural set of checks and balances to the acquisition process. Unfortunately, strong resistance to realistic testing exists because such testing invariably produces unflattering data that often inconvenience the military's senior leaders. They prefer to overlook or ignore unflattering data and, indeed, often suppress it. Many do not take kindly to giving equal weight to positive and negative data and have no desire for true checks and balances in the decision process.

There are basically two types of tests in the life of a weapons system, developmental tests and operational tests. They are distinct and separate, conducted by different agencies, and serve different purposes. Developmental tests are highly controlled, engineering-oriented tests designed to determine whether a new weapon meets technical requirements and formal contract specifications. The tests are conducted by the development community itself and are controlled by the program manager of the weapons system being developed. Program managers are rewarded for moving a new weapon through the developmental stage and into production. They are not rewarded for contributing the demise of their programs. Therefore, developmental tests are usually oriented toward success.

Operational tests are designed to stress the weapon in as realistic an operational environment as possible in order to determine its combat effectiveness. Operational tests are conducted by a testing agency within the service that is independent of the development community and the program manager. These tests are usually performed under combatlike situations and are less engineering oriented than developmental tests. Operational tests usually occur near the end of the developmental phase, and the weapons are representative of those that will come off the production line and go into inventory.

Because developmental tests are controlled by the program managers, it is not surprising that the results are often quite impressive on the surface. Close examination, however, may reveal that they are not really tests but more like staged demonstrations.

Source: Burton [38, p. 112].

Normally, a new weapon demonstrates outstanding developmental test results that are followed by disastrous operational test results. The acquisition community then averages the two together and argues that the overall results justify going into production.

Source: Burton [38, p. 113].

Brian Kernighan on writing:

Here's what professor Kernighan has to say about how the writing should be:

Try to place yourself in the shoes of someone who doesn't know a lot about the topic, and who knows the basics but isn't a language lawyer or a super programmer, and try to lead them by the hand through what they need to know.

Jargon becomes a big problem when the author knows too much. At some point, the author forgets that the purpose of the book is to teach, and it should not be a display of knowledge.

Source: victor noagbodji [220].

General Toomay became concerned about my attitude. Although he agreed with my assessment of the situation, he warned that if I continued to offer only criticism, I would become a nihilist, someone who believed in nothing. As he put it, “Critics are obliged to assume the role of author on occasion.” In other words, if you don’t like what’s going on, you have to offer a better alternative.

Source: Burton [38, pp. 56–57].

“The problem with the Irish people,” Ian says, as we drive away from the black hole that ruined Joe McNamara, “is that you can push them and push them and push them. But when they break they go wacko.”

Source: Lewis [132].

Michael Lewis on the Irish banking crisis:

In America the banks went down, but the big shots in them still got rich; in Ireland the big shots went down with the banks.

Source: Lewis [132].

Grounded theory:

### 3.1.2. *Grounded theory*

In contrast to these previous publications, the research presented in this paper does not focus on the outcomes of the intervention methodology, but rather on the detailed analysis of the transcripts of the design sessions, as a means of learning more general lessons about the design of usable security in e-Science projects. This analysis was conducted using *grounded theory*; a theory building analysis methodology which has proven useful in gaining a better understanding of security issues, such as those surrounding users’ perceptions of privacy in multimedia communications (Adams and Sasse, 2001).

According to Martin and Turner (1986), grounded theory is “...an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical observations or data.” Since grounded theory is a theory-building qualitative analysis tool, it is argued to be particularly suitable for areas in which a detailed description or understanding of the phenomenon does not exist.

The main analytical process of grounded theory consists of taking data, breaking it down, conceptualising it and reassembling it into new forms. The end result of the analysis is a theory that explains and is based on the data.

Source: Fléchais and Sasse [75, p. 284] [emphasis in original].

Imaginary conversations, continued. How to scare someone:

‘I am the greatest poisoner who ever lived. What you’ve never heard of me? Exactly.

‘Confidence is high.’

Source: SAGE radar displays? Also, every DPhil student when he first starts.

$\log \log \log x$  goes to infinity with great dignity.



Source: Dan Shanks. Quoted in <http://rjlipton.wordpress.com/2011/01/19/we-believe-a-lot-but-can-prove-1>.  
retrieved on 21st January 2011.

PowerPoint a.k.a. “Microsoft Work Simulator”

Source: [http://pipeline.corante.com/archives/2011/01/19/dogs\\_and\\_ponys.php#473187](http://pipeline.corante.com/archives/2011/01/19/dogs_and_ponys.php#473187)

Bush: ‘Our long national nightmare of peace and prosperity is finally over.’

Source: *The Onion*, 17th January 2001.

The extra mile is seldom congested.

Source: a sign along Arapahoe Road.

BlackDog said. . .

Never apologize for a paper. Ever. Single best lesson I learned in grad school.

January 7, 2011 11:21 AM

Source: <http://collegemisery.blogspot.com/2011/01/friday-thirsty-helena-from-homestead-is.html#comments>.

Get an editor—*ANY* editor, not necessarily Emacs—which at the *very* least *balances* [not counts—nobody counts] parentheses for you. For example, in most versions of Vi[1] ‘:set showmatch matchtime=2’ will ‘flash’ the cursor back on the matching open parenthesis for  $\approx 200$  ms whenever you’re in insert mode and type a closing parenthesis. And when sitting with the cursor on a parenthesis [either flavor], the ‘%’ command will move you to the matching parenthesis, and when used as the ‘motion’ command of a any of the commands that take motion commands to specify their scope, will select the entire *s*-expr as the argument. That is, “**ad**” (or “**ad**”) will copy an *s*-expr into Q-register “**a**” (or delete it, respectively); the “**ap**” command will ‘paste’ it back, “>%” and “<%” will shift all of the lines containing the *s*-expr right or left, respectively. [Note: When using Vi for Lisp, it helps to :set shiftwidth=1. Then you can do >%...to shift some form right four spaces, etc.]

[1] Some Lispers may consider me a heretic because I don’t use Emacs when writing Lisp. Tough. [I’ve *tried* to, several times, but my fingers just don’t bend that way. And besides, I’ve been using ‘moded’ editors like TECO, Bravo, Ed, & Vi for more than half my total lifetime.] Frankly, I spend such a *small* percentage of my programming time on ‘editor issues’ that I simply don’t buy the ‘I don’t have (or can’t use) the perfect editor (or IDE)’ obstacle as a legitimate excuse for not simply getting on with Lisp programming [though as noted in the text above it *does* help a lot if you have an editor that at least *shows* you the balancing paren, even better if it can delete/shift an *s*-expr as a group—which almost *all* can, even if not with a single keystroke].

So if someone says, ‘I can’t use Lisp... no Emacs,SLIME,IDE...’ I just say, ‘FIDO!’ [An acronym of supposed military origin; the last two letters stand for ‘Drive On’...]

Source: Rob Warnock, URI <https://groups.google.com/group/comp.lang.lisp/msg/6e91e20f2f371b52?dmode=source> retrieved on 5th January 2011, Subject: Re: How Lisp’s Nested Notation Limits The Language’s Utility in comp.lang.lisp, Sat, 05 May 2007 21:52:51 -0500.  $\LaTeX$ ed by rjl.

And just in case all the special characters in that last paragraph don’t survive the  $\LaTeX$ ing, here is the same thing in \verbatim:

1. Get an editor -- *\*ANY\** editor, not necessarily Emacs -- which at the *\*very\** least *\*balances\** [not counts -- nobody counts] parentheses for you. For example, in most versions of Vi[1] `":set showmatch matchtime=2"` will "flash" the cursor back on the matching open parenthesis for ~200ms whenever you're in insert mode and type a closing parenthesis. And when sitting with the cursor on a parenthesis [either flavor], the "%" command will move you to the matching parenthesis, and when used as the "motion" command of any of the commands that take motion commands to specify their scope, will select the entire s-expr as the argument. That is, "ad" (or "ad%") will copy an s-expr into Q-register "a" (or delete it, respectively); the "ap" command will "paste" it back, ">" and "<" will shift all of the lines containing the s-expr right or left, respectively. [Note: When using Vi for Lisp, it helps to `":set shiftwidth=1"`. Then you can do ">%"... to shift some form right four spaces, etc.]

[1] Some Lispers may consider me a heretic because I don't use Emacs when writing Lisp. Tough. [I've *\*tried\** to, several times, but my fingers just don't bend that way. And besides, I've been using "moded" editors like TECO, Bravo, Ed, & Vi for more than half my total lifetime.] Frankly, I spend such a *\*small\** percentage of my programming time on "editor issues" that I simply don't buy the "I don't have (or can't use) the perfect editor (or IDE)" obstacle as a legitimate excuse for not simply getting on with Lisp programming [though as noted in the text above it *\*does\** help a lot if you have an editor that at least *\*shows\** you the balancing paren, even better if it can delete/shift an s-expr as a group -- which almost *\*all\** can, even if not with a single keystroke].

So if someone says, "I can't use Lisp... no {Emacs,SLIME,IDE}..." I just say, "FIDO!" [An acronym of supposed military origin; the last two letters stand for "Drive On"....]

Source: *ibid.*

'Fröderick Frankenstien from Fresno' on how astronomers dress:

They invariably have flashlights in their pockets: white for professionals, red for amateurs.

Source: *College Misery*, December 18, 2010 12:20 AM. URI: <http://collegemisery.blogspot.com/2010/12/convention-uniforms-friday-thirsty.html#comments> retrieved on 20th December 2010.

"Let's just say that if complete and utter chaos was lightning, he'd be the sort to stand on a hilltop in a thunderstorm wearing wet copper armour and shouting 'All gods are bastards'."  
—Rincewind discussing Twoflower

Source: *The Colour of Magic* by Terry Pratchett.

These gates close in the evening, and students who like to get out after this have created an alternate opening known as Scholar's Entry. This is a place in the wall where bricks can be slid out to form a usable ladder, and has always been known only to students. However, many students forget that all the staff were, in their time, students themselves.

Source: Wikipedia, [http://en.wikipedia.org/wiki/Unseen\\_University](http://en.wikipedia.org/wiki/Unseen_University) retrieved on 5th December 2010.

Every procedure for getting a cat to take a pill works fine—once. Like the Borg, they learn. . .  
—Terry Pratchett, `alt.fan.pratchett`

Source: <http://www.lspace.org/ftp/words/pqf/pqf> retrieved on 4th December 2010.

I think perhaps the most important problem is that we are trying to understand the fundamental workings of the universe via a language devised for telling one another when the best fruit is.

—Terry Pratchett, `alt.fan.pratchett`

Source: <http://www.lspace.org/ftp/words/pqf/pqf> retrieved on 4th December 2010.

“But ye gotta know *where* ye’re just gonna rush in. Ye cannae just rush in *anywhere*. It looks bad, havin’ to rush oout again straight awa’.”

—Feegle tactics (Terry Pratchett, *The Wee Free Men*)

Source: <http://www.lspace.org/ftp/words/pqf/pqf> retrieved on 4th December 2010.

(in mechanics perfect means good enough)

Source: Ingalls [109].

So, faced with a Dementor, it wouldn’t exactly be comforting to ask: ‘What if the fear is just a side effect rather than the main problem?’

Source: *Harry Potter and the Methods of Rationality*, chapter 45.

The sky was completely dark, and stars were coming out, by the time they negotiated the Christmas traffic to the university town that was Oxford, and parked in the driveway of the small, dingy-looking old house that their family used to keep the rain off their books.

Source: *Harry Potter and the Methods of Rationality*, chapter 36.

### **Computer Programming:**

1. Every problem can be solved by breaking it up into a series of smaller problems.
2. The computer will always do exactly what you tell it to.

### **Software Engineering:**

1. Writing the code is the easy part. Writing it so someone else can understand it later is the important part.
2. Make it work, then make it elegant, then make it fast.

Source: Miller [149].

It was after lunch on Thursday afternoon, and Hermione and Harry were ensconced in a little library nook, with a Quietus field up so they could talk. Harry was lying stomach-down on the ground with his elbows resting on the floor and his head in his hands and his feet kicking up casually behind him. Hermione was occupying a stuffed chair much too large for her, like she was the Hermione center of a candy shell.

Source: *Harry Potter and the Methods of Rationality*, chapter 29.

Less than eight decades elapsed from the time the Wright brothers took to the air until the Space Shuttle took to space, the latter propelled by fuel carried in a tank so large that the trajectory of Wright's famous flight could fit inside it.

Similarly, only five decades elapsed from the time Robert Goddard wrote a paper in 1919 describing how a rocket might be constructed which could reach the moon until Neil Armstrong set foot there, having been propelled by a rocket reaching twice as high while still attached to the launch pad as the *altitude* achieved by Goddard's famous missile.

The first rocket to propel a man into space some three decades ago was about the same size as the lightning rod attached to the Space Shuttle launch pad.

Source: Augustine [13, p. 347 (emphasis in original)] and verified: Orville Wright's first flight on December 17, 1903 was 120 feet; the overall length of the external tank is 153.8 feet (source: Wikipedia).

But if the life expectancy of a regulation is so long as to inspire mortal policymakers to create them, it is much too *short* to provide the continuity needed to assure a stable lifetime for the average project. As noted previously, the average major item of defense-related hardware requires 8.3 years merely to develop, and remains in the inventory for 23 years thereafter in the case of an airplane and 33 years in the case of a ship (even excluding the lag between the end of development and the production of any individual item). Thus, viewing the development phase alone, there is in that period an average of one complete turnover of the regulations which were in being when a project was initiated, resulting in a whole superstructure of totally new regulations imposed subsequent to its birth. This is akin to changing the rules of a basketball game at halftime. Compound this regulatory turbulence during these formative years with the three aforementioned "streamlined" senior management decision-making council meetings, four successive sets of senior government officials, two sets of corporate leadership, eight budget cycles, and 144 votes in Congress on funding, and the miracle is not that many programs fail to survive but rather that some programs actually survive to fail.

Source: Augustine [13, p. 334–5].

If you want to make God laugh, tell Him your plans.

Source: Jewish proverb.

When I heard the learn'd astronomer;  
When the proofs, the figures, were ranged in columns before me;  
When I was shown the charts and the diagrams, to add, divide, and measure them;  
When I, sitting, heard the astronomer, where he lectured with much applause in the  
lecture-room,  
How soon, unaccountable, I became tired and sick;  
Till rising and gliding out, I wander'd off by myself,  
In the mystical moist night-air, and from time to time,  
Look'd up in perfect silence at the stars.

Source: Walt Whitman, *Leaves of Grass*, 1900.

My all time favorite file name is `.{BackSpace}`

Source: Rick <http://thedailywtf.com/Comments/The-Email-Tree.aspx?pg=3#327877>

Welding was faster, cheaper and, in theory, produced a more reliable product. But sailors do not float on theory, and the welded tankers had a most annoying habit of splitting in two.

Source: J. W. Morris, <http://www.mse.berkeley.edu/faculty/Morris/morris.html>.

Rushing in with new computers is not possible because of constraints in acquiring new technology by an acquisition process that Deputy Defense Secretary William Lynn told a Strategic Command Cyber Symposium audience takes “81 months from when an IT program is first funded to when it becomes operational.”

He added that “this means systems are being delivered four to five generations behind the state of the art.”

Source: Hodges [105].

An economic bubble is defined as any market in which a good is being traded in high volume at prices significantly above intrinsic value.

Source: George Saines <http://georgesaines.com/2010/10/21/the-higher-education-bubble-are-foreign-student-loans/> retrieved on 2010 October 23rd at 1322 MDT [181].

Everybody knows that the dice are loaded  
Everybody rolls with their fingers crossed  
Everybody knows that the war is over  
Everybody knows the good guys lost  
Everybody knows the fight was fixed  
The poor stay poor, the rich get rich  
That's how it goes  
Everybody knows  
Everybody knows that the boat is leaking  
Everybody knows that the captain lied  
Everybody got this broken feeling  
Like their father or their dog just died  
  
Everybody talking to their pockets  
Everybody wants a box of chocolates  
And a long stem rose  
Everybody knows  
  
Everybody knows that you love me baby  
Everybody knows that you really do  
Everybody knows that you've been faithful  
Ah give or take a night or two  
Everybody knows you've been discreet  
But there were so many people you just had to meet  
Without your clothes  
And everybody knows  
  
Everybody knows, everybody knows  
That's how it goes  
Everybody knows  
  
Everybody knows, everybody knows  
That's how it goes  
Everybody knows  
  
And everybody knows that it's now or never  
Everybody knows that it's me or you  
And everybody knows that you live forever  
Ah when you've done a line or two  
Everybody knows the deal is rotten  
Old Black Joe's still pickin' cotton  
For your ribbons and bows

And everybody knows  
 And everybody knows that the Plague is coming  
 Everybody knows that it's moving fast  
 Everybody knows that the naked man and woman  
 Are just a shining artifact of the past  
 Everybody knows the scene is dead  
 But there's gonna be a meter on your bed  
 That will disclose  
 What everybody knows  
  
 And everybody knows that you're in trouble  
 Everybody knows what you've been through  
 From the bloody cross on top of Calvary  
 To the beach of Malibu  
 Everybody knows it's coming apart  
 Take one last look at this Sacred Heart  
 Before it blows  
 And everybody knows  
  
 Everybody knows, everybody knows  
 That's how it goes  
 Everybody knows  
  
 Oh everybody knows, everybody knows  
 That's how it goes  
 Everybody knows  
  
 Everybody knows

Source: Leonard Cohen, 'Everybody Knows' (1988).

I'm honestly surprised we don't hear more of these stories. I've seen too often people look at their three year ATO as a trophy to put on the wall, and completely fail to continuously implement their security plans and patching schedules.

Source: Tom Albrecht, citing <http://communications.isgs.lmco.com/2010/10/ig-lockmart-census-system-had-vulnerabilities> ('IG: LockMart census system had vulnerabilities').

*Insignissime, etc., praesento vobis hos meos scholares in facultate Artium, ut admittantur ad gradum Magistri in Biochimia, vel Chimia, vel Scientia Computatoria, vel Scientiis Terrenis, vel Ingeniaria, vel Mathematica, vel Physica, vel Mathematica et Scientia Computatoria, vel Mathematica et Philosophia, vel Physica et Philosophia, vel Scientia Computatoria et Philosophia prout in schedula a Registrario scriptum est.*

Source: *Oxford University Gazette*, 30th September 2010.

Even when the owners of a burgeoning firm succeed in finding a bank that will do business with them they should leave it promptly if they are at all successful—at least that's the advice of Robert Kahn of Robert Kahn and Associates. "Change banks whenever your credit line has increased fivefold," he cautions. "No matter what you do, someone will always remember the borrowing level at which you started at the bank, and will then be able to persuade himself that your bubble is bound to burst."

Source: Augustine [13, p. 131].

'There's also a spike on the Fourier transform at the one-month mark where—' 'You want to stop talking right now.'

Source: <http://www.xkcd.com/523/>.

The “Fowler Hysteresis Law,” as it has become known, states, “When each element of capability is successively *deleted* until a system’s reliability is *altogether gone*, 30 percent of the cost still remains!”

Source: Augustine [13, p. 102], quoting Bert Fowler of MITRE [emphasis in original].

Every normal man must be tempted, at times, to spit upon his hands, hoist the black flag, and begin slitting throats.

Source: H. L. Mencken.

And if they start chasing you, just yell, “There he goes; follow me!”

Source: Piper [163].

I will not die an unlived life.  
I will not live in fear of falling or catching fire.  
I choose to inhabit my days,  
to allow my living to open me,  
to make me less afraid, more accessible,  
to loosen my heart until it becomes a wing, a torch, a  
promise.  
I choose to risk my significance,  
to live so that which came to me as seed  
goes to the next as blossom,  
and that which comes to me as blossom, goes on as fruit.

Source: Dawna Markova, *I Will Not Live An Unfulfilled Life*.

‘Fear of harm ought to be proportional not merely to the gravity of the harm, but also to the probability of the event.’

Source: Arnauld [12], quoted in translation in Bernstein [26, p. 71], citing Hacking [94].

The history of risk management is written in red as well as in black.

Source: Bernstein [26, p. 61].

I’m fluent in three languages: English, Sarcasm, and Profanity.

Source: <http://isc.sans.edu/diary.html?storyid=9556>

In order for a consumer to have assurance that the product’s claimed security features work correctly, the consumer is responsible for:

- Ensuring that they can provide the environment that is described in the Security Target.
- Configuring the product in accordance with the claimed evaluated configuration specified in the Security Target.

These responsibilities are often missed by IT security professionals and product consumers:

The consumer can only have assurance that the product will provide the claimed security functions and features when it is deployed in the intended environment, and in its evaluated configuration, as described in the Security Target. [quoted in original]

Source: Spicer [199].

Good science is built on consistency, great science on anomaly.

Source: Kean [117].

But keep in mind that ALL grad students (nearly without exception) go through a period of really, totally hating what they do. (Piled Higher and Deeper would not exist if this were not the case :-). Sometimes this slump can last for a year or more, and I've seen more than a few grad students quit as a result. Research is not always fun, or exciting, or sexy - usually there is this critical point about 3-4 years in when you are done with your first couple of projects and have to decide what's next, and hit a brick wall. The key is persistence.

Source: Welsh [224, comments].

Because what we are trying to do has never been done before and we are not very well qualified to do it or positive that people will care even if we can, there is absolutely no assurance that we will ever make a profit.

Source: Tobias [213, p. 66].

I worked for a post-doc one time who was quite remarkable. He was an MD simultaneously working on his endocrinology specialization while also doing a post doc in molecular biology and had a young child... he wasn't made of time. However he had a skill I think most other scientists should try harder to develop: A large majority of the experiments he did generated publishing quality data.

Now things didn't always work (though his experiments worked more often than those of most), but when they did he tended to be either done or need to repeat once or twice so he could publish 2-3 independent runs. What was remarkable was that he very rarely generated a result that was not of publishable quality. The first gel he ran would look good, be nice and even, etc. Ready to be a figure. He was methodical and never rushed to get a quicker but dirtier result. If he screwed up early in the process he would usually just start over, not continue knowing he would get unpublishable results. I think the time pressure he was under was making him a better scientist. He was working about half time but putting out as much finished work as those going at it 50 hours a week.

Source: <http://www.boingboing.net/2010/08/30/question-how-long-wo.html#comment-873319>.

You're not the person who started the PhD; you're someone else.

Source: <http://www.boingboing.net/2010/08/30/question-how-long-wo.html#comment-873267>.

The market can stay irrational longer than you can stay solvent.

Source: John Maynard Keynes

No, actually it was almost in final approach, and the hydraulic assist unit for the rudder decided[0], "Hmm. I think the rudder would really rather be... all the way to the LEFT. Oh, no, wait, the pilot's telling me this is not the case. Screw him, he never listens to *us*. I'll show HIM. HOW'S IT FEEL, YOU SANCTIMONIOUS LITTLE HAT-WEARING WANKER?"

This is why I refuse to get on 737s. Hydraulic assist thingummies apparently get crotchety in their old age, and in dog years, most 737s are dead.

[0] unilaterally, as it were

– Carl Jacobs



Source: <http://groups.google.co.uk/group/alt.sysadmin.recovery/msg/749671885f4a2f93?hl=en&mode=source>.

He didn't owe anybody in the world so much as a postcard. . .

Source: Thompson [211, p. 254]

When flight controllers for the Apollo programme were invited to participate in purchasing decisions for spacecraft hardware, they did not ask the potential vendor how a product worked, they were more interested in how it failed!

Source: Harland and Lorenz [98, p. 352].

Two different test levels are usually applied, 'qualification' for a test or engineering model, and a significantly less stressful 'acceptance' level for a flight unit. The qualification level is the design performance level, and usually represents the expected design flight levels, with some margin—i.e. the qualification levels are often more arduous than those expected in flight, although in some cases actual levels can be more severe due to environment modelling errors or launch problems. Thus a system that meets qualification levels can reasonably be expected to function properly in flight. The acceptance tests are based on the assumption that the components in the flight system are sufficiently similar (e.g. from the same production batch) that passing an acceptance test that should detect some gross deficiency implies that the performance should be the same as those that were subjected to the qualification test. That, at least, is the theory.

Source: Harland and Lorenz [98, pp. 327–8].

There are two types of testing failure. First is the failure of the test objective, in that the test is a measurement that proves to be inaccurate—an improperly conducted test may fail to detect a manufacturing or design error, or introduce a manufacturing error as a result of suggesting that (innapropriate) modifications are required. The second kind of testing failure is one in which the test causes damage.

Source: Harland and Lorenz [98, p. 327].

Always have a means of disabling an autonomous system!

Source: Harland and Lorenz [98, p. 326].

. . . if you're an engineer, you essentially want to be wrong half the time. If you do experiments and you're always right, then you aren't getting enough information out of those experiments.

Source: Peter Norvig, quoted in Schulz [185].

Black water shall elevate thy children to the heavens. Purify it. But thou shalt not combine it in a ratio greater than one kikkar to twenty shekkels, nor shalt thou burn rocks. Thus saith the lord.

Source: The Dead Sea Scrolls (?) via *The Register*: [http://www.theregister.co.uk/2010/08/06/new\\_spaceship\\_rocket\\_designs/page2.html](http://www.theregister.co.uk/2010/08/06/new_spaceship_rocket_designs/page2.html).

Since there exists in this four dimensional structure no longer any sections which represent 'now' objectively, the concepts of happening and becoming are indeed not completely suspended, but yet complicated. It appears therefore more natural to think of physical reality as a four dimensional existence, instead of, as hitherto, the evolution of a three dimensional existence. . . for us physicists believe the separation between past, present, and future is only an illusion, although a convincing one.

Source: Albert Einstein

In passing, it may be noted that part of the function of clean rooms, hats, booties and electrostatic discharge bracelets is actually psychological, because by the act of donning these items, which are neither glamorous nor comfortable, a worker acknowledges that he or she is about to work on delicate hardware and must pay particular attention.

Source: Harland and Lorenz [98, p. 280].

Here we see door 0020. (See Figure 28.) For at least a decade, this door has been known to the under- graduates as the earthquake door. According to the lore, in the early 1980s Caltech began changing its locks to high-security Medeco locks. Up until this point, undergraduates had been accustomed to exploring buildings after hours by picking their locks from the tunnels. 0020 Arms was the among the first doors to switch to these high-security locks. When the students found that the lock had been changed, they tried to pick it to find out what was behind the door. After several unsuccessful hours, they turned to more creative ways of bypassing the door. Above the door was a wire mesh, which they attempted to peel away to crawl through, but the space was too narrow. Eventually, they resorted to running against the door as hard as they could in an effort to find out what was behind the door. But the door held, and, defeated, the students went to sleep. The following morning, Caltech announced that an earthquake in excess of magnitude 6.0 had struck Pasadena. When no other geological stations confirmed the quake, Caltech revoked the report and moved the seismograph behind 0020 Arms to a more secure location.

Source: [11, pp. 22–23].

Regarding the Oxford University Press journal *Notes and Queries*:

The magazine has been likened to a nineteenth century version of a moderated Internet newsgroup.

Source: Wikipedia

He pulled the Daimler up to the front of the greenhouse where a liveried parking valet stood with the awed expression of a carpenter gazing at redwoods.

Source: Cussler [52, p. 62].

The guard was immune to the exotic cars and their celebrity occupants. He raised his hands over his head in a bored stretch and yawned. Then his hands froze in midair and his mouth snapped shut as he found himself staring at the largest car he'd ever seen.

The car was a veritable monster, measuring nearly twenty-two feet from bumper to bumper and weighing well over three tons. The hood and doors were silver-gray and the fenders a metallic maroon. A convertible, its top was completely hidden from view when folded down. The body lines were smooth and elegant in the grand manner, an example of flawless craftsmanship seldom equaled.

"That's some kind of car," the guard finally said. "What is it?"

"A Daimler," replied Pitt.

"Sounds British."

"It is."

Source: Cussler [52, p. 61].

"...engineering is the art of doing with one dollar that which any damn fool can do with two"

Source: Harland and Lorenz [98, p. xv].

The British expression ‘keep your pecker up’ does not translate well into American.

Source: TV tropes

*morituri nolumus mori* (‘We who are about to die don’t want to.’)

Source: TVtropes

If you lie to the compiler, it will get its revenge.

Source: Henry Spencer

[The common definition of estimate is] An estimate is the most optimistic prediction that has a non-zero probability of coming true.

Accepting this definition leads irrevocably toward a method called what’s-the-earliest-date-by-which-you-can’t-prove-you-won’t-be-finished estimating.

Source: Tom DeMarco (1982)

Good enough is neither

Source: Jim Spivey

Must be zero, or equal to `MAPI_UNICODE`. In either case, however, this parameter is ignored.

Source: <http://msdn.microsoft.com/en-us/library/ms859728.aspx>.

Good judgement comes from experience. Experience comes from bad judgement.

Source: Fred Brooks

Getting a SCSI chain working is perfectly simple if you remember that there must be exactly three terminations: one on one end of the cable, one on the far end, and the goat, terminated over the SCSI chain with a silver-handled knife whilst burning *black* candles.

Source: Anthony DeBoer

SCSI is not magic. There are *fundamental technical reasons* why you have to sacrifice a young goat to your SCSI chain every now and then.

Source: John F. Woods

My definition of an expert in any field is a person who knows enough about what’s really going on to be scared.

Source: P. J. Plauger, *Computer Language*, March 1983.

The difference between theory and practice is smaller in theory than in practice.

Source: unknown, cited in <http://stackoverflow.com/questions/58640/great-programming-quotes-closed>.

It should be noted that no ethically-trained software engineer would ever consent to write a DestroyBaghdad procedure. Basic professional ethics would instead require him to write a DestroyCity procedure, to which Baghdad would be given as a parameter.

Source: Nathaniel S. Borenstein in StackOverflow: <http://stackoverflow.com/questions/58640/great-programming-quotes-closed>.

At one advisory meeting to assess the progress of Ruth De Boer's PhD, Klapwijk recalled the student "practically in tears" as she presented her mobility measurements and described Jan Hendrick's as "better." De Boer said that in this period she was dejected and was thinking of giving up on her PhD topic, which would lose time.

Source: Reich [172, p. 140].

"When a scientist changes data in response to a reviewer's comment, that's a sign of intent," Dahlberg said.

Source: Reich [172, p. 123].

We finally found our way in, and looked into a room where there were some physicists doing work on the blackboard. One of them spotted Feynman, and pretty soon there was a crowd gathered, and the director came in. He decided they'd take us on a tour. We went into a 007, James Bond cave underneath the ground, with all this wonderful high-technology equipment. There was a giant machine that was going to be rolled into the line of the particle accelerator. The machine was maybe the size of a two-story building, on tracks, with lights and bulbs and dials and scaffolds all around, with men climbing all over it.

Feynman said, "What experiment is this?"

The director said, "Why this is an experiment to test the change-change something-or-other under such-and-such circumstances." But he stopped suddenly, and he said, "I forgot! This is your theory of change-change, Dr. Feynman! This is an experiment to demonstrate, if we can, your theory of fifteen years ago, called so-and-so." He was a little embarrassed at having forgotten it.

Feynman looked at this big machine, and he said, "How much does this cost?" The man said, "Thirty-seven million dollars," or whatever it was.

And Feynman said, "You don't trust me?"

Source: *No Ordinary Genius* by Christopher Sykes.

If something's working, you tend not to ask why it's working.

Source: Bertram Batlogg, quoted in Reich [172, chapter 4, p. 79].

Unlike stupidity, ignorance is curable.

Source: David R. Stone, Professor of History, Kansas State University.

Once they choose a research project, graduate students essentially fend for themselves—there are no courses, no tests, no timecards, no guardrails.

Source: Hall [95].

When you're in command, command.

—ADM Nimitz

Source: Slashdot quote of the day on 2010 Jun 25th.

Take the perceptions of Peter Lake, professor of history at Vanderbilt University...

“The constraints put on the British PhD,” he argues, “make it harder to do really significant work than it used to be, or (than it) is now in the States.”

(later)

“The more that you insist on tight completion rates and give grants only to people who have a precise sense of what they are going to work on (and often what they are going to find), the more you bias the system towards very predictable outcomes and away from work that makes a significant contribution to the subject.”

Source: Reisz [174].

You should embark on a PhD for what I describe as “the mountain climbing reason”—namely because it is there.

—Mark S. Leeson, Associate Professor, School of Engineering, University of Warwick

Source: Baty [18].

...make the actual raw data available, so the likelihoods can be computed for any hypothesis.

Source: Hutton [107].

I divide my officers into four classes; the clever, the lazy, the industrious, and the stupid. Most often two of these qualities come together. The officers who are clever and industrious are fitted for the highest staff appointments. Those who are stupid and lazy make up around 90% of every army in the world, and they can be used for routine work. The man who is clever and lazy however is for the very highest command; he has the temperament and nerves to deal with all situations. But whoever is stupid and industrious is a menace and must be removed immediately!

General Kurt von Hammerstein-Equord, 1933

Source: <http://www.ribbonfarm.com/2010/02/04/the-genealogy-of-the-gervais-principle/> retrieved on 19th June 2010.

Are you sure? I have a PhD and sometimes, I don't know what the fuck I'm doing.  
I'm just making it up as I go along...

When you graduate from high school you know everything.

When you graduate from college you realize you don't actually know everything.

When you get a masters' degree you realize you don't know *anything*.

When you get a PhD you realize nobody else does, either.

Source: Eric Wright <http://science.slashdot.org/comments.pl?sid=1691084&cid=32619892> retrieved on 21st June 2010.

When art critics get together they talk about Form and Structure and Meaning. When artists get together they talk about where you can buy cheap turpentine.

—Picasso

Source: <http://www.ribbonfarm.com/2010/03/18/the-turpentine-effect/> retrieved on 19th June 2010.

Win as if you were used to it,  
lose as if you enjoyed it for a change.

Source: Erick Golnik

The mission of this Allied force was fulfilled at 0241, local time, May 7, 1945.

Source: Dwight Eisenhower

In my field we tend to joke that if you put ‘Towards...’ as your title then you don’t need to have any results.

Source: ‘Bioinf’ in <http://www.phdcomics.com/proceedings/viewtopic.php?t=18933>.

A government contractor cannot be both honest and profitable.

Source: Dequasie [58, p. 201].

### **Doing Business with the Government**

Actually, doing business with the government is not my idea of a thing to do for profit; for loyalty or fun, perhaps, but not for profit. If a company doing business with the general public is successful and profitable, it’s commendable. But a successful and profitable government contractor is apt to have a pack of investigators snapping at its heels to find out what went wrong. A government contractor cannot be both honest and profitable. Isn’t that what the news media have been teaching us for several decades? We sort of believe it, don’t we? So why should anyone of high moral character and good repute risk losing all that by accepting a government contract?

Well, there are good arguments for loyalty. And those government efforts that involve doing something inspiring, new, and grand can be irresistible fun. There are projects in nuclear physics and space that only the government can finance, and they hold challenges that have got to be anything but boring. Fusion power and space exploration may also prove essential to the survival of our species. Out government and out species may both be imperfect but, for fun and loyalty, we ought to do our best to keep them both going.

Much is said of the evils of the military-industrial complex. The companies involved are often portrayed as greedy and corrupt entities, wildly overcharging the government. I do not see it that way. Doing business with the government is often a frustrating thing, with a great deal of delay and paperwork and the high risk inherent in having one huge customer who may suddenly not want what you are selling.

Source: Dequasie [58, pp. 201–202].

Success in science goes only to those who are utterly paranoid about things going wrong and utterly obsessive about preventing mishaps.

Source: [193, p. 6].

If you want to win in a software business, just take on the hardest problem you can find, use the most powerful language you can get, and wait for your competitors’ pointy-haired bosses to revert to the mean.

Source: Graham [93].

The statements that make people mad are the ones they worry might be believed. I suspect the statements that make people maddest are those they worry might be true.

Source: Graham [93].

Of course I inhaled. That was the point.

Source: Barack Obama

My advice to you is to start drinking heavily.

Source: *Animal House*

‘reasoned from first principles’  $\equiv$  ‘pulled it out of my ass’

Source: fuzzyfuzzyfungus on Slashdot.

I have long maintained that Japanese grammar is essentially Spanish done in reverse Polish notation.

—Elyse Grasso

Source: Cowan [51].

The difference between a demo and a test is that in a demo you control the input.

Source: Tom Marso in notes 20100413.0930.

William Gibson on working through writer’s block:

...writer’s block is my default setting. Its opposite is miraculous. The process of learning to write fiction, for me, was one of learning to almost continually be doing it *through* the block, in spite of the block, the block becoming the accustomed place from which to work. Our traditional cultural models of creativity tend to involve the wrong sort of heroism, for me. ‘It sprang whole and perfect from my brow’ as opposed to ‘I saw it misspelled, in mauve Krylon, on the side of a dumpster, and it haunted me’.

Source: William Gibson’s blog: Gibson [86].

Spanish is what happened when Moors tried to learn Latin and said ‘screw it’.

Source: Cowan [51].

It is instructive to interpret Sherlock Holmes’ famous quote, ‘When you have eliminated all which is impossible, then whatever remains, however improbable, must be the truth’, from a Bayesian viewpoint. The statement is technically correct; however, when performing this type of elimination to an (*a priori*) improbable conclusion, the denominator in Bayes’ formula is extremely small, and so the deduction is unstable if it later turns out that some of the possibilities thought to have been completely eliminated, were in fact only incompletely eliminated. (See also the mantra ‘extraordinary claims require extraordinary evidence’, which can be viewed as the Bayesian counterpoint to Holmes’ classical remark.)

Source: Tao [209].

State your message in one sentence. That is your title. Write one paragraph justifying the message. That is your abstract. Circle each phrase in the abstract that needs clarification or more context. Write a paragraph or two for each such phrase. That is the body of your report. Identify each sentence in the body that needs clarification and write a paragraph or two in the appendix. Include your contact information for readers who require further detail.

Source: Wood [233].

As Peter Feibelman points out in his book, *A Ph.D. is not Enough*, your primary duty as a young scientist is to finish something. Potential is nice, but not as important as demonstrated examples of mastery of specific skills that are useful.

Source: Anonymous [8], citing Feibelman [71].

Lisp is a medium for working with a computation until it is in balance with its external and internal requirements.

Source: Lamkins [129, Foreword].

From a text file referenced in a comment in Derek Lowe's *In the Pipeline*:

The FUNNIEST (albeit NOISIEST) incident was in Enid Oklahoma, where we built a brand new cylinder manufacturing facility. As part of the start up, and to begin manufacture, testing etc of PG cylinders, before the huge Loewe Forge was commissioned, we imported 3000 open ended cylinder "Shells" from the UK. These are forged from billet, open ended cylinders, about 9" diameter with solid forged base and a wall thickness of IIRC 0.215"...each one about 6 feet tall.

These were all stored in vertical ranks, by heat and lot number, in the 400,000 square feet Enid Facility...there to await finishing by spin forming the neck, heat treatment, machining etc., etc.

One day a forklift driver backed into the end of the serried ranks...

I sat in my office and listened for the best part of 30 minutes as row after row of the worlds biggest wind chimes "dominoed" and bounced and clanged and clattered and reverberated...The Forklift driver walked out of the building and never came back. No one was hurt...but there may have been a few who were brain dead after that enormous clatter.

Then they had to sort them all out...by heat and lot number...and stand them all in rows again! THIS time with anchor blocks and chains and...

;~)

teenut

Source: Bastow [17], cited in comment 8 of Lowe [140].

From *Derek's Laws of the Lab*:

A good undergrad will double your work load. A bad one will take out a wall.

Source: *In the Pipeline*.

From Derek Lowe's *In the Pipeline*:

Actually, I came out of the experience stronger than when I went in, for having gone through it without breaking. So, if you're trying to finish up your last year or two of a degree, and you feel as if it's never going to end, take it from me: it does. And if you think that you can't stand the time remaining, prepare to surprise yourself, because odds are very good that you can. And no, you won't always feel like you do on your worst days in your grad school lab. That's not the real world; it's just pretending to be.

Source: Lowe [143].

*ibid.* in comments:

The attitude is that if you have a reachable breaking point, well, you just aren't a scientist.

Source: Lowe [143, comment № 2].

From *The Rules, Standing Orders, and Special Schedules of the Oxford Union Society*:



### Rule 51: Dogs

Any Member introducing or causing to be introduced a dog into the Society's premises shall be liable to a fine of £5 inflicted by the Treasurer. Any animal leading a blind person shall be deemed to be a cat. Any animal entering on Police business shall be deemed to be a wombat.

Source: The Oxford Union Society [210].

This quotation came to me via an email from PACMISRANFAC HAWAREA, PMRF 7300 on 12th March 2010:

You can't spell PAIN without IA.

—Gregg McFarland

Gregg MacFarland lives in Hawaii.

I want to use this quote about tails:

The result of summing many independent random variables? A Gaussian distribution, most of it not on the points you saw and adapted to in the lab. Furthermore, Gaussian distributions have tails. As the number of samples grows, so, too, does the absolute number of points several standard deviations from the mean. The unusual starts to occur with increasing frequency.

Source: Bessey et al. [27, p. 67].

The following quotation appears in Hodge [104]:

Remember this distinction: The Donner Party was on track. They were not on schedule.

I need to remember this when I assure Dr Martin that I am on track. Am I on schedule?

From Slashdot [48]:

slashdot. where don knuth is an idiot because he cant grasp the awesome power of php

Wow. Just wow.

As a result, the average age at which the minority of young scientists who do actually land faculty jobs get to launch independent research careers by winning their first competitive grant has risen to 42. At that age, scientists of previous generations, such as Albert Einstein, Marshall Nirenberg and Thomas Cech, were winning their Nobel Prizes for work done in their twenties [23].

The following quotation from *Hamlet* might be useful in future:

'...therefore this project  
Should have a back or second, that might hold,  
If this should blast in proof.

—*Hamlet* Act IV Scene VII.

You don't use science to show that you're right, you use science to become right.

—Randall Munroe (source: xkcd № 701 [alt text] <http://www.xkcd.com/701/>).

I am going to try this exercise right now (in the middle of struggling with my software engineering talk due in scarcely more than a week).

## Taking ages to get nowhere

There are several quite different reasons for this, with different implications.

**Reason 1:** you are taking ages to get nowhere because you don't have the faintest idea what you are doing and where you are going. If you suspect this is the case, draw a diagram. It consists of an arrow going into a box. The arrow is your research question, the box is the data collection and analysis. Now draw arrows emerging from the box, with each arrow representing a different, logically possible outcome from the data collection and analysis. For instance, the outcomes may be 'A is greater than B', 'A is smaller than B' and 'A and B are the same size'. You should be able to list all the possible outcomes and explain why each one tells you something useful and significant. You should also know exactly what form your data will take and how you are going to analyse it, right down to the level of what tables you will use to show your results. (You should not, however, have more than a shrewd suspicion which particular answer you will find, otherwise your research is probably too trivial to bother with.)

Source: Rugg and Petre [179, p. 29]

I tested the following in  $\text{\TeX}$  and they work. Six consecutive hyphens in source for a 2-em dash (——) and nine for a 3-em dash (————).

The em dash ( $\&\#8212$ ;) is used to indicate a sudden break in thought (I was thinking about writing a—what time did you say the movie started?), a parenthetical statement that deserves more attention than parentheses indicate, or instead of a colon or semicolon to link clauses. It is also used to indicate an open range, such as from a given date with no end yet (as in Peter Sheerin [1969—] authored this document.), or vague dates (as a stand-in for the last two digits of a four-digit year).

Two adjacent em dashes (a 2-em dash) are used to indicate missing letters in a word (I just don't f——ing care about 3.0 browsers).

Three adjacent em dashes (a 3-em dash) are used to substitute for the authors name when a repeated series of works are presented in a bibliography, as well as to indicate an entire missing word in the text.

—Sheerin [190]

So my conclusion is, when Poe writes of the activities of M. D—— in the year 18—, this is the correct way to typeset it [166].

There are four approaches to achieving system dependability [82]:

**Fault avoidance:** How to prevent, by construction, fault occurrence or introduction.

**Fault tolerance:** How to provide, by redundancy, a service complying with the specification in spite of faults.

**Fault removal:** How to minimise, by verification, the presence of faults.

**Fault forecasting:** How to estimate, by evaluation, the presence, the creation and the consequences of faults.

It is commonly agreed that a combination of these approaches must be used in order to achieve ultra-high dependability.

[82] LAPRIE, J.C.: 'Dependability: a unifying concept for reliable computing and fault tolerance' in ANDERSON, T. (Ed.): 'Dependability of Resilient Computers', chapter 1 (Blackwell Scientific Publications, Oxford, 1989) pp. 1–28

—Bowen and Stavridou [30, p. 4]

Safety is closely coupled to the notion of risk. Charette [28] defines risk as an event or action:

- *Having a loss associated with it.*

- *Where uncertainty or chance is involved.*
- *Some choice is also involved.*

Safety can then be defined as the freedom from exposure to danger, or the exemption from hurt, injury or loss.

[28] CHARETTE, R.N.: ‘Applications strategies for risk analysis’ (McGraw Hill, Software Engineering Series, 1990)

—Bowen and Stavridou [30, p. 2]

McCormick hit back, however, telling the paper that “we have been dealing with doubters for ten years. One of the problems we have is that the machine does look a little primitive. We are working on a new model that has flashing lights.”

de Bruxelles [55]

When ham radio operators erect a new mast in their backyard, they often leave it unconnected for a month or two. When the inevitable complaints of baby monitors malfunctioning, televisions going crazy, and other non-sense crap from their neighbors blamed on the mast gets reported to the FCC or the police, the ham radio operator calmly leads them outside and shows them the disconnected cable that goes nowhere and does nothing.

Perhaps commercial entities should take note of this, given our remarkable slide into the cesspool of stupidity where we believe in 9/11 conspiracy theories, vaccinations causing brains to turn into jello and yellow smoke to pour out, and how we’re being poisoned by EM waves, and a particle accelerator’s going to cause the world to end.

Seriously... There should be an idiot tax on court filings.

—‘girlintraining’ [88] in Slashdot

He probably also didn’t tell his wife that, in many cases, when a cellphone is in an area of very weak or nonexistent coverage its response is to kick its transmitter into full “Scotty, we need more power!” mode in an attempt to remain in contact.

—‘fuzzyfuzzyfungus’ [81] in Slashdot

Back in the Sixties Unimate built BIG robots, hydraulically powered machines the size (and power) of a backhoe to do spot-welding on car bodies, that sort of thing. At an industrial exhibition they put one of these monsters in a booth making cups of coffee for the attendees. The cycle involved grasping a coffee pot from a bolted-down hotplate, splashing some boiling-hot coffee in the vague direction of the cup sitting in a mount to keep it accurately positioned, then it would get a bottle of milk from a fridge fixed firmly to the floor and splash some of that into the cup. All of the location stuff was due to the lack of any external sensors on the robot; it was simply going through a sequence of steps in three-dimensional space while opening and closing its gripper.

The robot worked perfectly, the coffee was crap. Sadly the door handle on the fridge couldn’t take the strain and finally gave way. The robot grasped the door handle and pulled. The fridge door stayed shut, the handle came away in the gripper. The robot released the handle and reached into the fridge to get the bottle of milk. Did I mention this thing has about as much power as a backhoe? It got the milk bottle. When it swung back towards the audience it was wearing the fridge door like a bangle while fraspang [*sic*] some shards of glass. At that point the booth bunnies running the demo managed to get to the Big Red Mushroom switch before it launched the door into the crowd and killed potential customers.

—‘nojay’ [156]

From *Rate Your Students* (RYS), a spotter's guide to presenters at science conferences:

The past postings on the humanities conferences have cracked me up. While there are similar personality types, it is worth mentioning a bit more about science conferences, given the 'logistical differences' in how research is conducted (primarily in how collaboration is important, so you have to smile and be nice even if you're conversing with a real dickwad). I'm not in a particularly large research field, and attend mostly national conferences with attendance rarely exceeding 400 individuals, but from what I've seen so far I can offer some tales of my own, and illustrate some differences vs the MLA-AHA flava so far.

1. The venue—there are two themes: swanky downtown hotel, or a hotel 'related to' the research field e.g. next to a renowned laboratory complex, or a majestic natural feature or park. Seeing as we don't have security clearance to roam the lab complex, or care to traipse out into  $-20^{\circ}\text{C}$  (except for yahoos from Edmonton who exclaim "This is nothing! And I'm wearing pants instead of shorts just so that you won't think I'm showing off!"), the downtown hotel venue is much preferred. The 'natural-theme' venue is always located far from any variety of restaurant or drinking establishments, which means you're stuck with paying \$14 for a breakfast muffin or \$7 for a light beer in the hotel. Recently, however, several natural sciences conferences have been held in casino resorts, with the surrounding wilderness of forests and lakes being the justification for the venue. Yeah, right.
2. The job market—There are NO job interviews associated with the conferences I attend. Maybe a small handful (2–3) of job advertisements for applications to PhD or postdoc projects at the message board.
3. The hooking-up—basically none, unless you're fellow graduate students, and MSc's at that with no intent to pursue further grad studies. If you're a PhD or postdoc, your supervisor has more 'invested' in your career outcome and will dissuade you from doing anything stupid—today's fling and tomorrow's reject might be 10-years-from-now-grant-referee. This is definitely a no-no within your subspecialty, where there's a lot of collaboration out of sheer necessity, when each lab can afford only one \$1-million piece of equipment in an experiment that requires 5–10 steps, each with its own piece of equipment sophisticated enough to make sharks with frickin' laser beams on their heads seem like an old foot-pedal-cranked Singer sewing machine.
4. The personalities:
  - early MSc's: don't actually have any lab or fieldwork data yet, so they present 'this is my project design' type talks; easily identifiable by their wide-eyed, jittery and nervous demeanour before they give their talk. If their supervisor isn't attending the conference, after their talk they tend to disappear to their hotel room or out to the bars to get shit-faced for the duration. Those presenting on the first day are envied and tend to have the time of their life at the conference, those presenting on the last day generally need several days after the conference to recuperate from the extended build-up of tension. It's worth noting at this point that nearly everyone in the natural sciences drinks heavily, while the biomedical types appear to be gathering an army of tightly-wound-up teetotalling vegetarians.
  - mid-PhD's with some results under their belt: still tentative enough to have a lot of 'maybe's, perhaps and could be's' in their talks.
  - near-the-end PhD's: lots of pronouncements about the earth-shattering nature of their research. They throw in lots of absolutes into their conclusions, as they hope this bold and confident demeanour will influence audience members who may make up search committees of where they'll be applying for a post-doc or prof position. Their questions at the end of other talks can be best described as 'assholey', even though they think they're being incredibly insightful.
  - post-docs: fairly rare at conferences, as their salaries mean that supervisors are loathe to pony up even more money for conference travel. Extremely earnest, friendly folks, a consequence of the desperation they feel over future job prospects, so they

look for anyone to throw them a bone. They actually ask the best questions at the ends of talks, as they both want to come across as smart but also don't want to piss off a potential employer in the audience. They drink heavily too, but tend to start to cry after doing so for awhile. The especially bitter postdocs form a glowering clique of drinkers at the far corner of the bar, which you approach at your own peril if you're a gainfully employed new prof.

- new profs: smiley and happy, and will present absolutely nothing of consequence. They present the uninteresting (yet still publishable in a low-tier journal) left-over data from their PhD and postdoc(s), and likely will continue to do so for several years. Usually have one or two MSc students in tow who are in way over their heads and have no idea what the hell they are doing (and neither does the prof). It's early days still, so this shit will sort itself out eventually.
- mid-career profs: plenty of recently separated or divorced people in this bunch. Producing their first crop of PhDs after 5 years of only attracting MSc applications followed by 5–7 years of nurturing PhD candidates, who they now protectively hover over and introduce to other profs at the conference in the hopes that the networking will mean their student will land a future postdoc or job—grant review panels want you churning out grad students who actually go on and get employment in science—this also means you can never burn bridges with a grad-flake, as you need to check up on them every 3–5 years with a friendly how-you-doing to find out what they're up to, so you can fill out that info on your grant application. The ones in their early 40s who announce “I just finished paying off my student loans!” are good for mooching a few drinks from.
- old profs: they drink a lot of 12 year old Scotch at the hotel bar, and the Emeritus profs have no problem telling off colour sexist jokes. They chair the national and international grant review committees that decide the fate of your funding, so you don't ever, ever talk any smack about them that might come back to you. If their talk goes over time, no way the moderator's got the *cojones* to inform them that their time is up. If the research field has undergone a startling paradigm shift in the last couple of years (usually due to advances in technology), this prof's talk will deviate from the submitted abstract and instead be a rant about how all the research being done by new profs is black-box absolute shit.

Anonymous [7]

Cf. notes 20100108.2345:

After about three hours of this frivolity, I remembered that a friend who was then residenting (what is the verb form for this?) at another hospital told me that he never got a chance to eat when he was at work.

I slipped out of the hospital and brought back a large pepperoni from the pizzeria around the corner. Offered it to the docs. They accepted, ate a few slices, looked at my finger, gave me a tetanus shot and I finally went home.

Anyway, that's what I learned about emergency rooms: If possible, bring pizza.

—‘Molly, NY’ [152]

Someone on the forum asked the following question in regards to the suggestion above by ‘Molly, NY’ [152]:

If I went to the ER one night to order (yes, and pay for) pizzas for the good folks there, would you say they would like that, or would it interfere with their evening, or would it just be creepy/dumb?

I believe they would like that very much, especially if you included a thank you card.  
The only interference it would cause would be the staff tripping over each other to get to the pizzas, but don't worry, if they injure each other, they are in the right place.  
—'Taaki' [206]

That's one of those irregular verbs, isn't it? I give confidential security briefings. You leak. He has been charged under section 2a of the Official Secrets Act.  
—Bernard Woolley

67 percent of graduate students said they had felt hopeless at least once in the last year; 54 percent felt so depressed they had a hard time functioning; and nearly 10 percent said they had considered suicide, a 2004 survey found. By comparison, an estimated 9.5 percent of American adults suffer from depressive disorders in a given year, according to the National Institute of Mental Health. [76]

It is better to solve the right problem the wrong way than to solve the wrong problem the right way.  
—Richard Hamming

Apparently, this chunk of marble didn't have an elephant in it.  
—Dilbert

The difference between 2001 and 2009 is that the bad guys have gone professional.  
—Greg Edwards, 20091117.1020 MDT in the LMCO book club, on [3, p. xx].

*ab abusu ad usum non valet consequentia* ('Rights abused are still rights.' Source: Wikipedia.)

There is nothing more soothing to fallible human beings than the news that they've been obscurely tested and have triumphantly passed [130, p. 189].

See the six foot man eating chicken!  
—P. T. Barnum

If you look at the theory of tort, a risk should lie with the party that's best able to mitigate it.  
—Ross Anderson, quoted in [148]

[S]hareholders expect a return on their investment. It is risk and return. If you can't articulate squarely that you're in a high-risk environment, you can't do risk management.  
—John Stewart, Cisco [113, p. 48]

Grab a mop—let's get to work.  
—President Barack Obama

From the Wikipedia article on 'Imaginary colour'

If a saturated green is viewed until the green receptors are fatigued and then a saturated red is viewed, a perception of red more intense than pure spectral red can be experienced. This is due to the fatigue of the green receptors and the resulting lack of their ability to desaturate the perceptual response to the output of the red receptors.

Citation: Lindsay and Norman [133, pp. 196–216].

And thereby hangs a tale: In 1978, when I was working in banking, I ran across a curious date storage format. It seems that transaction dates were coded with the last digit of the year in one nibble, the month in hex in the next, and the date (in packed decimal) in the next two. I asked one of the more senior systems analysts about this and she informed me that when the record was originally designed, only the month and day (in packed decimal) had been included. This caused sorting problems on statements printed in January, because checks written in the December of the previous year would sort after checks written in January of the current. So the format had been modified to the one I just described.

"Good grief!" said I. "What happens in January of 1980?" She turned pale and admitted she had considered that before but managed to put it out of her mind. "So why not go ahead and fix it now?" I asked.

She pointed out that fixing it would require expanding the demand deposit master record format, a mammoth undertaking. About a billion COBOL programs would have to be recompiled. At this shop we were still on cards and a rush compile took about a week. "You want to do that?" she inquired. This time I turned pale. We considered our options, knowing that one or the other of us would be called upon to fix the problem. And you know what we did?

First, I modified the daily demand deposit program with code that checked for the date and about mid-1979 started printed warnings on the console of what would happen come new year. Then the systems analyst and I got new jobs. This is known as stepwise interactive development.

—D. Gary Grady [91]

(House, M.D. has been abusing his grad students again)

ADMINISTRATOR: Do you want them to go home feeling like that?

HOUSE: I don't want them going home.

I love *Nineteen Eighty-Four*; it reminds me of work. I love *House* because it reminds me of school.

Spaf's First Law:

If you have responsibility for security but have no authority to set rules or punish violators, your own role in the organization is to take the blame when something big goes wrong.

—Eugene Spafford, cited in [198].

I work in HR for a Fortune 500 company, so let me tell you from a recruiter's perspective: when people have a cover letter, it makes me **much** more likely to pay attention to their resume. If the cover letter is addressed to someone in my department (or me), it's another major plus to your chances.

Taking a few minutes to look up some basic info about the position you are applying for and a few more minutes to get even a basic understanding of a company's goals and values can make a huge difference. It's up to **you** to show **me** that you're worth looking at...don't expect that handing me a resume makes you worth more than a 10 second look at your qualifications. And yes, I'm serious about only looking at resumes for 10 seconds. Do it right or don't do it at all.

—comment on Reddit [http://www.reddit.com/r/AskReddit/comments/9qe81/reddit\\_i\\_never\\_lie\\_on\\_my\\_resume\\_never\\_get\\_hired/c0dy7r8](http://www.reddit.com/r/AskReddit/comments/9qe81/reddit_i_never_lie_on_my_resume_never_get_hired/c0dy7r8)

I have something here for you. Your father wanted you to have this when you were old enough, but your uncle wouldn't allow it. He feared you might follow old Obi-Wan on some damn fool idealistic crusade like your father did. It's your father's lightsaber. This is the weapon of a Jedi Knight. Not as clumsy or as random as a blaster, but an elegant weapon for a more civilized age.

—*Star Wars*, 1977

One of my former colleagues adopted such an approach decades ago. For many years now he has arisen early each morning, virtually every day of the week, and sat down to write for several hours. Some days are more productive than others, but he averages a page or two. Multiply that total by 365 days a year, and you'll know how he has managed to achieve one of the strongest publication records of anyone in his field [39, p. 72].

The two years, remember, is two years *in residence*. I know hardly anyone in literature who actually completed a dissertation in two years. You take the exams (first term), research like mad for two years, and then actually write the dissertation in the US, while you are adjuncting or working as a VAP or doing an (easier) 9–5 job with a decent salary (e.g., gofer and copier at a law firm). This was done even when all “supervisions” (e.g., supervisor readings and comments on work in progress) had to be done by postal mail; e-mail has made it very easy. Then you go back, defend the dissertation while jet-lagged, and take a vacation to celebrate [188].

My definition of an expert in any field is a person who knows enough about what's really going on to be scared.

—P. J. Plauger [1983]

3. Crack open your current project. Now, delete as much stuff as you can and still have it work. Done? Okay, now toss out more, because I know that your first pass was too timid. Pretend that you're paying cash for every line of code. If your project incorporates code by other people, wade into their stuff, too. You'll be amazed how much can come out.

Don't leave unused code hanging around because it might be useful someday. If it's not being used right now, remove it, because even just sitting there it's costing you. It costs to compile (you have to fix build breaks in stuff you're not even using), it costs to ignore it in searches, and the chances are pretty good that if you do go to use it someday, you'll have to debug it, which is really expensive.

It's tremendously freeing to zap the fat in a system, and after a while it's addictive. Read all code with an eye towards “What is superfluous?” and you'll be amazed at how much unused, half-written and buggy crap there is in loose in the world, and how much better off we are without it. [64]



The most likely way for the world to be destroyed is by accident. That's where we come in; we're computer professionals. We cause accidents.

—Nathaniel Borenstein (source: <http://www.urbin.net/EWW/sigs/puter-sigs3.html>)

Properly done science is a sort of masochistic game where one beats one's head against a wall until it falls down, and then goes in search of another wall.

—Steven Vogel (source: <http://www.urbin.net/EWW/sigs/puter-sigs2.html>)

### *Terrell Rotation*

Consider a cube moving across your field of view with speed near the speed of light. The trailing face of the cube is edge on to your line of sight as it passes you. However, the light from the back edge of that face (the edge of the square farthest from you) takes longer to get to your eye than the light from the front edge. At any given instant you are seeing light from the front edge at time  $t$  and the back edge at time  $t - (L/c)$ , where  $L$  is the length of an edge. This means you see the back edge where it was some time earlier. This has the effect of rotating the image of the cube on your retina.

This does not mean that the cube itself rotates. The image is rotated. And this depends only on the finite speed of light, not any other postulate or special relativity. You can calculate the rotation angle by noting that the side face of the cube is Lorentz contracted to  $L' = L/\gamma$ . This will correspond to a rotation angle of  $\cos^{-1}(1/\gamma)$ .

It turns out, if you do the math for a sphere, that the amount of apparent rotation exactly cancels the Lorentz contraction. The object itself is flattened, but then you see behind it as it flies by just enough to restore it to its original size. So the image of a sphere is unaffected by the Lorentz flattening that it experiences.

Another implication of this is that if the object is moving at nearly the speed of light, although it is contracted into an infinitesimally thin pancake, you see it rotated by almost a full 90 degrees, so you see the complete backside of the object, and it doesn't disappear from view. In the case of the sphere, you see the transverse cross-section (which suffers no contraction), so that it still appears to be exactly a sphere.

That it took so long historically to realize this is undoubtedly due to the fact that although we were regularly accelerating particle beams in 1959 to relativistic speeds, we still do not have the technology to accelerate any macroscopic objects to speeds necessary to reveal the effect.

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Source: <http://www.ibiblio.org/lunar/school/library/finilite.html>

You know you're in trouble when the Russians are adding safety features to your design.

—Maciej Ceglowski [42, note 5]

We reject kings, presidents, and voting. We believe in rough consensus and running code.

—David D. Clark, IETF

- Do it.
- Do it right.
- Do it right now.

—Attributed to Bobby Riggs. Source: <http://www.multicians.org/thvv/proverbs.html>

Adventure is just bad planning.

—Amundsen

Do not think that what is hard for you to master is humanly impossible; but if a thing is humanly possible, consider it to be within your reach.

—Marcus Aurelius, *Meditations* VI, 19

In the morning, when you are sluggish about getting up, let this thought be present: ‘I am rising to a man’s work.’

—Marcus Aurelius, *Meditations* V, 1

So for the hairsbreadth of time assigned to thee, live rationally, and part with life cheerfully, as drops the ripe olive, extolling the season that bore it and the tree that matured it.

—Marcus Aurelius, *Meditations* IV, 48 (Source: wikiquote)

Waste no more time arguing about what a good man should be. Be one.

—Marcus Aurelius, *Meditations* X, 16

The supposed longer version of the ‘ancient Chinese curse’:

- May you live in interesting times.
- May you come to the attention of those in authority.
- May you find what you are looking for.

Source: wikipedia (‘May you live in interesting times’).

So, how do you manage a project without controlling it? Well, you manage the people and control the time and money. You say to your team leads, for example, “I have a finish date in mind, and I’m not even going to share it with you. When I come in one day and tell you the project will end in one week, you have to be ready to package up and deliver what you’ve got as the final product. Your job is to go about the project incrementally, adding pieces to the whole in the order of their relative value, and doing integration and documentation and acceptance testing incrementally as you go.” [57]

In nature, a wrong guess is preferable to a slow one.

—unknown

‘Proceed,’ said I. ‘Or not,’ said Dupin.

—Edgar Allan Poe, ‘The Purloined Letter’

‘That is another of your odd notions,’ said the Prefect, who had a fashion of calling everything ‘odd’ that was beyond his comprehension, and thus lived amid an absolute legion of ‘oddities’.  
—Edgar Allan Poe, ‘The Purloined Letter’

You’re right, I did lose a million dollars last year. I expect to lose a million dollars this year. I expect to lose a million dollars next year. You know, Mr Thatcher, at the rate of a million dollars a year, I’ll have to close this place in...sixty years.  
—Charles Foster Kane

*nil sapientiae odiosius acumine nimio* (‘Nothing is more hateful to wisdom than excessive cleverness’)  
—attributed to Seneca in *The Purloined Letter* by Edgar Allan Poe but nowhere else.

Congresspeople live in their own little world where everything works.  
—Miranda Kathleen Loughry (20090701.1804)

*The overriding concern of analysis is not to achieve success, but to avoid failure* [56, p. 9]  
[emphasis in original].

If you visit the Royal Naval Museum at Greenwich, England, you will see the results of some of the world’s most successful specification efforts: the admiralty models. Before any ship of the line was constructed, a perfect scale model had to be built and approved. The long hours of detail work were more than repaid by the clear understandings that come from studying and handling the models [56, p. 7].

‘You always do everything «silently»’, she said. Why is that? He raised one eyebrow in response.

The last ten digits of Graham’s number are ...2464195387.  
—Wikipedia

In 1878, the philosopher Charles Sanders Peirce explained the difference between deduction and induction using the simple image of a bag of beans. If you know a bag of beans has all white beans and you start picking beans from this bag, then you can *deduce* that the next bean picked from the bag will be white. On the other hand, if you know nothing about the bag, but you start removing beans from the bag and they are all white, then you may *induce* the rule that all the beans in the bag are white [189, p. 215].

I’ve experiments to run, there is research to be done... [50]

Problems worth of attack  
Prove their worth by hitting back.  
—Piet Hein

The mark of a truly educated mind is when, in evaluating a situation, the person can spot when something is missing.

—*Uncertain Principles* blog: [http://scienceblogs.com/principles/2006/05/true\\_lab\\_stories\\_the\\_sound\\_of.php](http://scienceblogs.com/principles/2006/05/true_lab_stories_the_sound_of.php) (first comment)

PKI, like communism, almost works.

—John Lyle

We mean that we move everything that we believe is relevant; if the phenomenon is not the same, we suggest that something relevant has not been moved, and we proceed to look for it. [74, vol. 1, p. 11–1]

Discovery consists in seeing what everyone else has seen and thinking what no one else has thought.

—Albert Szent-Györgi (1937 Nobel Prize for Medicine)

A gentleman need not know latin but should at least have forgotten it.

—a tutor at Trinity College (cited by Raymond T. Pierrehumbert, U. of Chicago, in his Halley Lecture on 20090604.1630.

If the question of where to start seems overwhelming, you are at the beginning, not the end of this adventure. Being overwhelmed is the first step if you are serious about trying to get at things that really matter on a scale that makes a difference. So what do you do when you feel overwhelmed? Well you have two things: you have a mind, and you have other people. Start with those and change the world.

—Liz Coleman, Bennington College President (TED talk in 2009)

I enjoyed following the parentheses on that actually. I think I know LISP now.

—‘sevincorvina’ [http://www.reddit.com/r/WTF/comments/8oas0/this\\_sounds\\_tastier\\_i\\_wonder\\_what\\_the\\_nutritional/c09x3zd](http://www.reddit.com/r/WTF/comments/8oas0/this_sounds_tastier_i_wonder_what_the_nutritional/c09x3zd)

*Do! Or do not. There is no ‘try’.*

—Yoda

*When you are going through hell, keep going.*

—Churchill

If you are trying to produce a commercial product in a timely and cost efficient way, it is not good to have somebody’s PhD research on your critical path.

—Chip Morningstar [153]

Linus Pauling was asked, ‘how come you have so many good ideas?’ He said,

I have lots of ideas. Some of them are good.

There are three ways to ruin a company:

- Business consultants; that's the fastest way
- Wining & whoring, that's the most pleasant way
- SAP; that's the most certain way

—*The Daily WTF*

<http://thedailywtf.com/Comments/Laundry-of-the-New-Millennium.aspx#260043>

The minute you begin to believe your own hypothesis, you are a dead duck as a scientist.

—Anonymous (quoted in Reich [173] comments)

A maths limerick:

A conjecture both deep and profound  
Is whether the circle is round.  
In a paper by Erdős  
Written in Kurdish  
A counterexample is found.

The whole point of graduate school is proving that you can make it out of there.

—Derek Lowe [142]

Once is happenstance. Twice is coincidence. Three times is Enemy Action.

—A. Goldfinger

'Begin at the beginning, and then go on until you come to the end; then stop.'

*Alice in Wonderland*

Most people aren't remembered after they're gone. *'I wonder where Bob got the plutonium?'*  
is better than most get.

—Unknown

The First Law of Log Analysis: the number of times an uninteresting thing happens is an interesting thing.

—Marcus Ranum

In a dilemma, it is helpful to change any variable, then reexamine the problem.

—Robert A. Heinlein

What I cannot create, I do not understand.

—Richard P. Feynman

... the purpose of abstraction is *not* to be vague, but to create a new semantic level in which one can be absolutely precise.

—Dijkstra Dijkstra [59], cited in Henney [101]

Mathematics may be defined as the subject in which we never know what we are talking about, but we know whether what we are saying is true.

—Bertrand Russell

The following is probably due to the comedian Eugene Mirman: <http://comedians.comedycentral.com/eugene-mirman/videos/eugene-mirman---security-question>

I love the ‘write your own questions’ kind of security question, especially if there’s a place where you can call and make someone ask you the question.

OPERATOR: Before we proceed, I need to verify your identity. What are you wearing?

ME: I think that’s highly inappropriate.

OPERATOR: Great, how may I help you today? [232]

‘G.P.W.’, editor of the Oxford Magazine (supplement to the official *Gazette*) is always good for a quotation.

If you want to know where the bodies are buried, look in the Annexe. [231]

From the Oxford University *Gazette*:

SENIOR PROCTOR: *Insignissime Vice-Cancellarie, licetne Anglice loqui?*

VICE-CHANCELLOR: *Licet.*

SENIOR PROCTOR: I’m always afraid he is going to say, ‘No!’

Source: [77]

From Monty Python:

I’m getting better.

No you’re not, you’ll be stone dead in a moment.

Well, I can’t take him like that. It’s against regulations.—Monty Python and the Holy Grail

Explanation of Credit Default Swaps (CDS):

Unlike traditional insurance, Cassano was offering investors an opportunity to bet that *someone else’s* house would burn down, or take out a term life policy on the guy with AIDS down the street. [207]

DSW conducted by trained professionals on closed track. Do not attempt.

... that was the big revelation to me when I was in graduate school—when I finally understood that the half page of code on the bottom of page 13 of the Lisp 1.5 manual was Lisp in itself. These were “Maxwells Equations of Software!” This is the whole world of programming in a few lines that I can put my hand over.

I realized that anytime I want to know what I’m doing, I can just write down the kernel of this thing in a half page and it’s not going to lose any power. In fact, it’s going to gain power by being able to reenter itself much more readily than most systems done the other way can possibly do.

All of these ideas could be part of both software engineering and computer science, but I fear—as far as I can tell—that most undergraduate degrees in computer science these days are basically Java vocational training. [72]

The technique that we had for Smalltalk was to write the VM in itself, so there's a Smalltalk simulator of the VM *that was essentially the only specification of the VM* [emphasis added]. You could debug and you could answer any question about what the VM would do by submitting stuff to it, and you made every change that you were going to make to the VM by changing the simulator. After you had gotten everything debugged the way you wanted, you pushed the button and it would generate, without human hands touching it, a mathematically correct version of C that would go on whatever platform you were trying to get onto. [72]

If you look at software today, through the lens of the history of engineering, it's certainly engineering of a sort—but it's the kind of engineering that people without the concept of the arch did. Most software today is very much like an Egyptian pyramid with millions of bricks piled on top of each other, with no structural integrity, but just done by brute force and thousands of slaves. [72]

As someone working as an engineer, with part of my job consisting of recruiting other engineers: Please don't encourage usage of L<sup>A</sup>T<sub>E</sub>X resume templates! Keep it underground :)

The secret indication of a CV with high potential is that it's made in LaTeX and not Word or some other mainstream software. It's actually proven to be an excellent interview filter. Almost a majority of our best hires had CV's created with L<sup>A</sup>T<sub>E</sub>X. [197]

Good government. Good government. Sit. Stay. —G. M. Harding Institute [110]

'Yer a wizard, Harry', said Hagrid. [138]

What happens when one end of the interface disappears for a while? [157]

Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires not that the writer make all sentences short, or avoid all detail and treat subjects only in outline, but that every word tell. [204]

... a student will have it in their bedroom.—a Porter at St Cross College on 18th February 2009

Astronomers deal with small numbers:  $10^{80}$  or some such; biologists are the people in charge of large numbers.—Prof. Simon Conway-Morris

*in principio creavit Deus caelum et terram*

*terra autem erat inanis et vacua et tenebrae super faciem abyssi et spiritus Dei ferebatur super aquas*

*dixitque Deus fiat lux et facta est lux*

When I get to choose my textbooks—rarely, because standardization is all the rage—I try to avoid “textbooks”, even for lower-level classes. I choose *real* books that are relevant to the subject.—<http://rateyourstudents.blogspot.com/2008/08/big-thirsty-responses-textbooks-we-dont.html>

In most countries students compete to get into college. In America colleges compete for students, the destructiveness of which (in terms of quality education) can hardly be overstated. — <http://rateyourstudents.blogspot.com/2008/06/everyone-should-not-go-to-college-one.html>

Learning to manage your own work (setting your own deadlines, learning to keep them) is the difference between those who move up ladders, corporate and otherwise. It is the difference between finishing your dissertation and not doing so; it is also the difference between getting tenure and not getting tenure at research universities. Pretending you're above that sort of "deadline nonsense" just says to me that you are a sloppy and undisciplined scholar, not that you are producing golden eggs. — <http://rateyourstudents.blogspot.com/2008/04/barbie-bitchy-bear-one-of-our-favorite.html>

No one will ever read your dissertation. Visit any research university. See the rows upon rows of heavy cloth bound dissertations? There's a 1923 dissertation on the use of mythology in Herodotus's histories. The spine is uncracked, the author long dead. Instead of letting this grim fact depress you, take heart: your committee members won't actually read your dissertation. They'll skim the introductory chapter, lightly, make a few notes, then go back to playing Tiger Woods Golf. So, focus your attention on the Introduction. If you can write 18 pages of solid prose, you can graduate with a Ph.D.

And that, Margie, is a task you can accomplish this weekend. — <http://rateyourstudents.blogspot.com/2008/04/barney-from-baltimore-earns-our.html>

I got a brilliant paper from a student last week. It was beautifully written, the topic was interesting, the wording showed thought and the grammar and punctuation were beyond reproach. So of course I Googled it. I Googled select phrases, I Googled entire paragraphs. I got a colleague to access TurnItIn for me so they could do the work. And, after several hours of this, I came to the conclusion that a student had actually done an assignment, correctly, and put forth intellectual effort. The possibility had honestly not occurred to me. [6]

If we choose to install every patch immediately it is released we face the risk that a patch may conflict with existing software or hardware and bring systems to a halt.

If we choose to delay installation, even by a day, we risk attacks from people who have reverse-engineered malware from the patches.

Given that there is no win/win solution it appears to me that we either have to accept that our systems will occasionally fail or decide that using MS Windows for critical systems is tantamount to professional negligence.

—Bernard Peek [159]

'Give me five minutes' said the bomb technician, nervously.

Run good, strong, experiments. Run them right, think hard about the results, and don't be afraid of what they're telling you.—Derek Lowe [144]

What can be done now, that couldn't be done before? Have an answer for this.—Doc Smith



Knowledge is power. Power corrupts. Study hard. Be evil.—*unknown*

I may be wrong but I'm certain.—trad.

Don't say 'responsible for...' or 'experienced...' on a résumé; instead use quantitative words and say things like 'Wrote six user guides for 15,000 users two weeks before deadline.'—*Squawkfox* (<http://www.squawkfox.com/2009/01/19/6-words-that-make-your-resume-suck/>)

Dissertations are not finished; they are abandoned.—Fred Brooks [15].

You gain strength, courage, and confidence by every experience in which you really stop to look fear in the face. You must do the thing which you think you cannot do.—Eleanor Roosevelt

Talent hits a target no one else can hit; Genius hits a target no one else can see.—Schopenhauer

The superior pilot uses his superior judgement to avoid getting into situations requiring him to demonstrate his superior skill. —Trad.

Howard Hill supposedly while filming the shots for the Robin Hood movies was approached by a 'lay' archer who professed to be a good shot. Hill asked the man if he could see that telephone pole, as he pointed to a pole about 75 yds away. The man responded 'yes, I think I could hit that.' Hill drew an arrow and lobbed it into the top of the pole, turned and walked away.

The point of accessors is to be able to trigger important side effects when a value changes, so that the program's state remains consistent. The point of putting them in from the beginning is to leave that option open in the future. Nice languages give you the ability to automatically synthesize accessors until/unless a more specific implementation is necessary [151].

COMSEC will be well-served with critical re-examination of old ideas and quite a batch of hoary premises (including some in Volume II), particularly by our new people. Just be sure of your facts [29, p. 54].

The major difference between something that can go wrong and something that cannot possibly go wrong is that when something that cannot possibly go wrong goes wrong it usually turns out to be impossible to get at or repair.

—Douglas Adams, *Mostly Harmless*

The general root of superstition is that men observe when things hit, and not when they miss, and commit to memory the one, and pass over the other.

—Bacon (1561–1626)

## Acknowledgements

Who should I thank? My so-called “colleagues,” who laugh at me behind my back, all the while becoming famous on my work? My worthless graduate students, whose computer skills appear to be limited to downloading bitmaps off of netnews? My parents, who are still waiting for me to quit “fooling around with computers,” go to med school, and become a radiologist? My department chairman, a manager who gives one new insight into and sympathy for disgruntled postal workers?

My God, no one could blame me—no one!—if I went off the edge and just lost it completely one day. I couldn’t get through the day as it is without the Prozac and Jack Daniels I keep on the shelf, behind my Tops-20 JSYS manuals. I start getting the shakes real bad around 10am, right before my advisor meetings. A 10 oz. Jack ’n Zac helps me get through the meetings without one of my students winding up with his severed head in a bowling-ball bag. They look at me funny; they think I twitch a lot. I’m not twitching. I’m controlling my impulse to snag my 9mm Sig-Sauer out from my day-pack and make a few strong points about the quality of undergraduate education in Amerika.

If I thought anyone cared, if I thought anyone would even be reading this, I’d probably make an effort to keep up appearances until the last possible moment. But no one does, and no one will. So I can pretty much say exactly what I think.

Oh, yes, the acknowledgements. I think not. I did it. I did it all, by myself.

Olin Shivers  
Cambridge  
September 4, 1994

[191]

Some people would go so far as to say OO is the collection of bits of formal methods that actually worked.

[10]

It is important not to confuse academic writing with communication—a common, real world mistake.

[9]

We have had systems fail because the backup system was not able to handle the peak load on the main system: in other words, the ‘backup’ turned out to be unable to take over when most needed. So it wasn’t a ‘backup’ at all.

[222]

[Guy Fawkes day]. . . in honour of the only man ever to enter Parliament with honest intentions.—Chris Suslowicz

‘If you know the vulnerabilities (weaknesses), you’ve got a shot at understanding the threats (the probability that the weaknesses will be exploited and by whom). Plus you might even be ok if you get the threats all wrong. But if you focus only on the threats, you’re probably in trouble.’

[114]

One of the basic and difficult lessons every artist must learn is that even the failed pieces are essential.

[19, pp. 5–6]

In Chapter XIX, Wilkins talks about the need for objective validation (and not by appeal to Magick) of IA systems:

I have heard of a great Pretender to the knowledge of all secret Arts, confidently affirm, that he himself was able at that time, or any other, to shew me in a Glasse what was done in any part of the World; what Ships were sailing in the *Mediterranean*; who were walking in any Street of any City in *Spain*, or the like. And this he did aver with all the labour'd Expressions of a strong Confidence. [229, p. 81]

*For now Trithemius and Selenus both are grown Such Cryptographers, as they scarce will own Thee for their Master; and Decipherers know such secret Ways to write, thou ne'er didst show. These are but Artists which thou didst inspire; But now thou of a Mercury art Sire of thine own Name, a Post with whom the Wind, should it contend, would be left far behind.* [229, v.]

The Poets have feigned *Mercury* to be the chief Patron of Thieves and Treachery,

ἀρχὸς φηλητίων.

To which purpose they relate that he filched from *Venus* her Girdle, as She embraced him in Congratulation of a Victory; that he robbed *Jupiter* of his Scepter, and would have stoln his Thunderbolt too, but that he feared to burn his Fingers. And the Astrologers observe, that those who are born under this Planet, are naturally addicted to Theft and Cheating.

If it be feared that this Discourse may unhappily advantage others in such unlawful Courses; 'tis considerable, that it does not only teach how to deceive, but consequently also how to discover Delusions. [229, p. 90]

... as conceiving that such a Discovery would be of excellent Use, especially for some Occasions that are incident to *Statesmen* and *Soldiers*.

That the Ignorance of *Secret* and *Swift* Conveyances, hath often proved Fatal, not only to the Ruin of particular Persons, but also of whole Armies and Kingdoms, may easily appear to any one that is but little versed in Story. And therefore the redressing of these may be a Subject worth our Enquiry. [229, p. 5]

Now as it will concern a Man that deals in Traffick, to understand the several kinds of Money, and that it may be framed of other materials besides Silver and Gold: So likewise does it behove them who profess the Knowledge of Nature or Reason, rightly to apprehend the several Ways whereby they may be expressed.

So that besides the Usefulness of this Subject for some special Occasions, it doth also belong unto one of the Liberal Arts.

From which Considerations we may infer, that these particulars are not so trivial as perhaps other-ways they would seem; and that there is sufficient motive to excite an Industrious Spirit unto a further Search after them. [229, p. 6]

After this, I did collect all such notes to this purpose, as I met with in the course of my other studies.

From whence when I had received full satisfaction, I did for mine own further delight compose them into this method.

This I have now published; not for the publique good (which I doe not think my poore abilities can promote) but to gratifie my brother the Stationer.

The benefits of that trade do chiefly confist in the printing of coppies; and the vanity of this age is more taken with matters of curiofity, then those of folid benefit. Such a pamphlet as this, may be falable, when a more fubstantiall and ufull difcourfe is neglected.

I have already attained mine owne ends, both in the delight of compofing this, and the occafion of publifhing it. And therefore neede not either feare the cenfure of others, or beg their favour. I could never yet difcerne that any Reader hath fhewed the more charity, for the Authors befpeaking it. Farewell.

## I. W.

It's an iPhone, it has a soft x-ray flash.—*me*

Trust is a quality, not a quantity.

Trust is difficult to measure, difficult to transfer, and trust is not transitive.

Trust is simply “that which is essential to a communications channel but which cannot be transmitted from a source to a destination over that channel”.—Edgardo Gerck, [www.mcg.org.br/trustdef.txt](http://www.mcg.org.br/trustdef.txt)

Trust: cryptographic key establishing a secure logical channel.

Trusted Computing Base: Totality of protection mechanisms inside a computer system.

“if it is trusted, it can hurt you.”

Trusted code = code running as system.

Untrusted code = code running in a sandbox.

... granting of rights is often transitive.

Access rights are often given because they are required to do a job, not to express trust. What has this got to do with trust?

Access control has well developed theories, talking about trust is an unnecessary distraction: Delegation of access right = delegation of trust?

Trust metrics operate on attributes that cannot be measured.

TCBs do not guarantee trust, they ask for it.

PKIs do not create trust but support existing contractual relationships.

Trust is often used as a placeholder when we can't say precisely what we mean (this is a familiar problem in security).

—Dieter Gollmann [90]

Ford was not going to be outcooled. [2] p. 105

The TCG definition of trust (due to Proudler): ‘... always behaves in the expected manner...’

“... make sure that you tell them this: It is defended!”—The Doctor, *The Christmas Invasion*

WESTLEY: Can you move at all?

BUTTERCUP: Move? You're alive. If you want, I could fly.

—*The Princess Bride*

Crito, we owe a cock to Asclepius. Please pay it.—Socrates [164]

It's good enough for the thesis  
[184].

I looked at this problem back in the early 1980s, when I was doing some work on TCP. I was trying to come up with a routing protocol that didn't require passing the same information around repeatedly, because backbone networks had very low bandwidth back then, and the existing routing protocols had either  $O(N^2)$  traffic or the “hop count to infinity” problem.

I came up with something called “Gateway Database Protocol”, which was a scheme for passing tuples of the form “ $X$  says  $Y = Z$ ” around. The idea was that any node seeing inconsistencies in “ $X$  says...” would propagate the tuple back to  $X$ , revealing the problem to  $X$ . [4]

(re: transfer report) ‘Start with some statistics.’ —Shamal

... for what we have in the small way... to understand thoroughly, we must, as philosophers, produce in a larger way, if needful, that we may examine the different parts. [70] Lecture II, 1860.

We didn't make them for anybody, we made them for ourselves, which was probably the most sensible way to do it anyway.—Chuck Jones, in [180], cited in a comment by ‘gludington’ on [234]

*Dieu me pardonnera—c'est son métier.* [205] p. 241

I have learned in the course of my career that one of the simplest ways in which a technical man can offend a financier is to use the law to protect his own interests. [205] p. 209

If you see something unusual, even if it is only slightly unusual, don't ignore it: find the cause. Three Mile Island is an internationally famous example of the consequences of ignoring this principle. [82] p. 29

One—if not the only—advantage of not being regularly trained for any particular profession or calling is that you feel yourself free to turn your hand to any job that offers, without concern about danger to your professional status. [205] p. 36

George Davis accompanied this announcement with advice as how to behave in a Government establishment. ‘Swindin,’ he said, ‘you will be watched by a lot of officials who will be impressed by the *speed* at which you work, rather than by quality and accuracy. Use two drawing boards—one for your real drawings and the other for display when officials are around. Cover the display one with a large number of lines—any sort of lines. When they have gone, get on with your proper work. What Government officials do *not* like is employees just *thinking* ! [205] pp. 26–27

I found papers read before technical bodies one of the cheapest and most effective forms of advertising ! [205] p. 188n.

In a heavily loaded computer system, a steady stream of higher-priority processes can prevent a low-priority process from ever getting the cpu. Generally, one of two things will happen. Either the job will eventually be run (at 2 AM Sunday morning when the system is finally lightly loaded) or the computer system will crash and lose all unfinished low-priority jobs. (Rumor has it that when they closed down the 7094 at MIT in 1973, they found a low-priority job that had been submitted in 1967 and had not yet been run.) [161], p. 109

... in London, when a flood warning is received, the first action of the authorities is to send someone down to the river to check the level. Kletz [123, §14.6.1, p. 186]

During an incident investigation, it is often useful to ask why the incident happened when it did and not at some other time? [123] §9.1, p. 120

The word *similar* should never be used in specifications or instructions.

Another word that should not be used is *all*. [123] §9.1, p. 119

We do not begrudge spending money on complexity but are reluctant to spend it on simplicity. [123] §5.1.2, p. 68

(*Reasonably practicable* is a UK legal phrase that recognizes the impracticability of removing every hazard and implies that the size of a risk should be compared with the cost of removing or reducing it, in money, time, and trouble. When there is a gross disproportion between them, it is not necessary to remove or reduce the risk.) Kletz [123, Chapter 4, p. 63], citing [99].

Gans *et al.* say that big failures usually have simple causes while marginal failures usually have complex causes. If the product bears no resemblance to design, look for something simple, like a leak of water into the plant. If the product is slightly below specification, the cause may be hard to find. Look for something that has changed, even if there is no obvious connection between the change and the fault. [124] §19.6, p. 350, citing [82].

From *The Cask of Amontillado* by Edgar Allen Poe:

“These vaults,” he said, “are extensive.”

“The Montressors,” I replied, “were a great and numerous family.”

“I forget your arms.”

“A huge human foot d’or, in a field azure; the foot crushes a serpent rampant whose fangs are embedded in the heel.”

“And the motto?”

“*Nemo me impune lacessit.*”

“Good!” he said.

Was Montessor the foot, or the serpent?

What do they know of England who only England know?—Kipling, cited in [124] §14.10, p. 287

Whenever we carry out a test, we may find a fault, and we must be prepared for one. [124] §14.8, p. 286

Inevitably, a book like this one is a record of failures. It is pleasant to be able to describe accidents prevented by the alertness of operating staff. [124] §11.7, p. 241

That’s just one example of Airbus software wonderfulness. [5]

The important thing about security systems isn’t how they work, it’s how they fail. [60]

This is why some investment banks save everything. They create a rebuttable presumption that if they don’t have it, it doesn’t exist. (Often helpful when the other side alleges there is a “smoking gun”) [219]

Errors also occur because people deliberately decide not to carry out instructions that they consider unnecessary or incorrect. These are called violations. [124] p. 79

We should always try to measure the property we wish to know directly, rather than measuring another property from which the property we wish to know can be inferred Kletz [124, p. 89].

If you want to judge a team, look at its labels as well as the technical problems it has solved. [124] p.98

Many of the incidents occurred because operators did not realize how fragile tanks are. They can be overpressured easily but sucked in much more easily. While most tanks are designed to withstand a gauge pressure of 8 in. of water (0.3 psi or 2 kPa), they are designed to withstand a vacuum of only 2½ in. of water (0.1 psi or 0.6 kPa). This is the hydrostatic pressure at the bottom of a cup of tea. [124] p. 114

His countenance likes me not.—*King Lear*, act 2, scene 2

With cloud computing you outsource *all* your hardware. [111]

I don't consider these Storm Bot-net waves to be so much of a threat—I consider them like an EICAR for an organization's incident response process. If your security policies and incident response procedures are having difficulty with this kind of event, they both need some assistance and re-tooling. [134]

GNU—a printer driver gone horribly wrong—‘maht’ [146]

But a remodel of infrastructure will require that we adapt to living nearer to it. In the past, a proposal to build a power plant is met with a chorus of outrage or “concern”. It used to be called NIMBY—**Not-In-My-Back-Yard**. The latest acronym is BANANA—**Build-Absolutely-Nothing-Anywhere-Near-Anything**. —‘gaussling’ [83]

Original scientific definition of the metre as dictated by Napoleon to his Minister for Science:

Give me a rationale for a measurement close enough to the yard as to make no real inconvenience for people but slightly bigger than the English one.

—Robert Long [135]

Some people, when confronted with a problem, think “I know, I'll use regular expressions.” Now they have two problems. —Jamie Zawinski [79]

Oxford is very far from standing in need of a Panegyric, having already gain'd the universal esteem and admiration of the world. [40]

Let it suffice to say of Oxford, what *Pomponius* said of Athens, *It is so eminent that there needs no pointing at it*. [40]

People are not only risk averse when it comes to gains and risk seeking when it comes to losses; people also value something more when it is considered as something that can be lost, as opposed to when it is considered as a potential gain. Generally, the difference is a factor of 2 to 2.5. [183]

We tried to take advantage of Richard's talent for clarity by getting him to critique the technical presentations that we made in our product introductions. Before the commercial announcement of the Connection Machine CM-1 and all of our future products, Richard would give a sentence-by-sentence critique of the planned presentation. “Don't say ‘reflected acoustic wave.’ Say [echo].” Or, “Forget all that ‘local minima’ stuff. Just say there's a bubble caught in the crystal and you have to shake it out.” Nothing made him angrier than making something simple sound complicated. [102]

Meetings will continue until morale improves. —Niklas Karlsson



[continuing a story about his German teacher]

He also told a story about listening to their communications on Christmas Eve one year. He said that there was the standard East German radio traffic going on, and mid-sentence they stopped, and said in clear, unaccented English, ‘we’d like to wish a Merry Christmas to...’ and then read off the names of all the people in the US listening station that night, including the German teacher.

Not the names of every one who worked there, mind you—just the people who were there *at that particular moment*. [116]

But Rome’s own position (undoubtedly influenced by Manning!) was clear: in the same year Propaganda declared that ‘a youth can scarcely, or not scarcely even, go to Oxford without throwing himself into a proximate occasion of mortal sin.’—W. Ward, *The Life of John Henry Cardinal Newman*, 1912, vol 2, 195.

By January 1895 a majority of English bishops voted to petition the Holy See that attendance at Oxford and Cambridge might thenceforth be tolerated, subject to adequate spiritual safeguards. [200]

‘It has taken us thirty years and more to learn that the special danger of Oxford and Cambridge is not immorality or even false teaching, but unchecked speculation acting on raw and untrained minds. The true safeguard against the perfect freedom of youthful criticism is the possession of a religion of one’s own.’—Bishop Hedley, 1864. J. C. Hedley, ‘Cardinal Wiseman’ *Ampleforth Journal* III. 3 (April 1898), 272.

This is my *x*. There are many like it but this one is mine.

A **THEN-IF** is an early warning that a decision tree is growing the wrong way. A null **ELSE** indicates that the programmer knows that trouble lies ahead and is trying to defend against it. An **ELSE GOTO** from such a structure may leave the reader at a loss to understand how the following statement is reached. A null **THEN** or (more commonly) **THEN GOTO** usually indicates that a relational test needs to be turned around, and some set of statements made into a group with **DO-END**. [118]

“Anytime you talk to people—especially a group of people—you’re by definition creating an illusion,” he said some months later. “You’re projecting the illusion that you’re talking to each one of them individually. So you’ve got to picture in your mind what the conversation would be if it was just with one person. You’ve got to make each individual feel like they’re witnessing a play in a drawing room and that they’re sitting in a comfortable chair listening to lines that are intended just for them.”

Boger used a variety of stage tricks to elicit such feigned intimacy—lowering his voice to make a point; speaking to the back row, which gave those in forward rows the impression that he was speaking to them. His main device, though, was a strenuously rehearsed spontaneity. As he spoke, Boger listened intently to his own words, then quickly anticipated the questions of those in the audience and tried to answer them matter-of-factly in the next sentence or two. Thinking that this was what anyone who wanted something from another person did unconsciously, as a matter of course, he was surprised that others didn’t try to systematize it. And yet he did it so well that it allowed him to give the same talk over and over, never once the same, without the slightest trace of boredom. [225]

Yield indefensible terrain—ostentatiously. Rarely will all the points, both of fact and law, be in your favor. Openly acknowledge the ones that are against you. In fact, if you're the appellant, run forth to meet the obvious ones. [182, 194]

Researchers on 'human subjects' raise difficult dilemmas and issues. Among many others: the academic significance of the researches; what benefits might flow from them; for whom and over what time-scale; clarification of their purposes; constraints on the publication of findings; holding and using data and information about people; potential harm to researchers and participants, and avoidance or minimization of any risks; to whom are researchers accountable and for what; the social and political context and implications of research; the consequences, intended and unintended, of publication.

In Britain, researchers are vulnerable to the extraordinarily wide, and profitable, interpretations of defamation and libel. [230]

In ideal happyland, where people didn't act like idiots and do stupid shit like abuse amphetamines to the point where they start seeing unicorns, the middleman known as the pharmacist wouldn't even need to exist. [68]

I've since found that removing code is a great way to improve an existing system; not only do you get rid of a lot of bugs, but the result is usually easier to understand, and often runs faster. Have a large, unwieldy project that takes forever to build and you have trouble making changes to? Wade in and start deleting. Become a ruthless of constructive destruction; if you accidentally nuke something critical, just resurrect it from the project depot. Software is great! [63]

Some people may think six xterms and a few athena apps are all the UI that anyone should need, but I disagree. [41]

If you *hope* it will work, it's probably religion.  
If you *expect* it to work, it's probably magic.  
If you know *why* it works, it's probably science. [212]

'...they act as a natural interlock - "you can do anything you like as long as it's from this short list of approved options." And the fact that someone has to actually write code in order to effectuate a bad idea makes it less likely the bad idea will happen fast.' [171]

She knows, now, absolutely, hearing the white noise that is London, that Damien's theory of jet lag is correct: that her mortal soul is leagues behind her, being reeled in on some ghostly umbilical down the vanished wake of the plane that brought her here, hundreds of thousands of feet above the Atlantic. Souls can't move that quickly, and are left behind, and must be awaited, upon arrival, like lost luggage. [85]

The O-rings of the Solid Rocket Boosters were not designed to erode. Erosion was a clue that something was wrong. [73]

Isn't it enough to see that a garden is beautiful without having to believe that there are fairies at the bottom of it too? [2]

I discovered later that this one is actually from Gene Spafford [198]:

[from memory] If you have responsibility in the organisation, but no corresponding authority, then your function is to take the blame when something goes wrong.—Dr. Rob Collins (track down the reference in SDE notes)

It strikes a man more dead than a great reckoning in a little room.—Shakespeare, *As You Like It*

...security researchers form a habit of seeing threats and hidden agendas everywhere they look without much regard to how likely these scenarios are. [14]

Never check for an error that you don't know how to handle.—Landon Dyer <http://www.dadhacker.com/blog/>

For a successful technology, reality must take precedence over public relations, for nature cannot be fooled. [73]

Einstein argued that there must be simplified explanations of nature, because God is not capricious or arbitrary. No such faith comforts the software engineer.—Fred Brooks, Jr. [37]

You can't hide secrets from the future with math. [147]

'...the alternative is an institutional-sized easy-open pressurized Can O' Worms.'—Derek Lowe [141]

Erasmus Darwin had a theory that once in a while one should perform a damn-fool experiment. It almost always fails, but when it does come off is terrific. Darwin played the trombone to his tulips. The result of this particular experiment was negative.—J. E. Littlewood *A mathematician's miscellany* from [http://www.geocities.com/j\\_r\\_partington/oldquotes.html](http://www.geocities.com/j_r_partington/oldquotes.html)

If there is a problem you can't solve, then there is an easier problem you can't solve: find it. [167]

When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the stage of *Science*, whatever the matter may be.—*Sir William Thomson, Lord Kelvin* [*Popular Lectures and Addresses*, 1891, vol. 1, 'Electrical Units of Measurement', 1883-05-03] [237]

*lector, si monumentum requiris, circumspice* —epitaph of Sir Christopher Wren, St Paul's Cathedral, London. [192]

SUBTUS CONDITUR  
HUIUS ECCLESIAE ET VRBIS CONDITOR  
CHRISTOPHORUS WREN,  
QUI VIXIT ANNOS ULTRA NONAGINTA,  
NON SIBI SED BONO PUBLICO.  
LECTOR, SI MONUMENTUM REQUIRIS,  
CIRCUMSPICE.  
Obijt XXV. Feb: An.<sup>o</sup> MDCCXXIII. Æt. XCI.

*Note: Try to get a clear photograph of this during Kate's visit in September to London.*

'Yet I swear the other is a word: I learnt it somewhere.' [158] p. 29

... a simple idea: XML documents with embedded function calls. [1]

According to Bacon, scientists should travel over the earth collecting facts, until the accumulated facts reveal how Nature works. [49]

*wärmetod*: heat death

'A maxim of technology is that failures reveal underlying mechanism. A good way to learn how something works is to push it to failure. The way it fails will usually tell you a lot about how it works.' [28]

Fred Brooks said something like, when you're doing computer graphics, 'you have a responsibility to tell the truth.' [36]

The difference between engineering and folklore is that engineers learn from failures. [137]

CMMI Level 5 organizations *learn*. [137]

'Hoyle's use of the Anthropic Principle to predict the existence of a resonant reaction  ${}^8\text{Be} + {}^4\text{He} \rightarrow {}^{12}\text{C}$  and the nonexistence of a resonant reaction  ${}^{14}\text{C} + {}^4\text{He} \rightarrow {}^{16}\text{O}$  was one of the greatest predictions in the history of science.' [69]

Three is a magic number. What three things are your research about? —*Ivan F.*

Presentation is  $\geq 50$  percent of the effort. A slick presentation is critical. —*Ivan F.*

What are the important problems in your field? Why aren't you working on one of them? [96]

No battle plan survives contact with the enemy. —*Helmuth Karl Bernhard Graf von Moltke*

‘The Prussian field marshal’s version was not so succinct, however. What von Moltke wrote was “Therefore no plan of operations extends with any certainty beyond the first contact with the main hostile force.” In a process that’s routine in the world of quotation, von Moltke’s actual words were condensed into a pithier comment over time, then placed in more-familiar mouths.’ [119]

From a certain point onward there is no longer any turning back. That is the point that must be reached. —*Franz Kafka*

Once you entomb mathematics in an artificial language *à la* Hilbert, once you set up a completely formal axiomatic system, then you can forget that it has any meaning and just look at it as a game that you play with marks on paper that enables you to deduce theorems from axioms. You can forget about the meaning of this game, the game of mathematical reasoning, it’s just combinatorial play with symbols! There are certain rules, and you can study these rules and forget that they have any meaning! —*Gregory Chaitin [re: metamathematics]* [43]

“(a youth”, stated the church, “can scarcely go to Oxford without throwing himself into a proximate occasion of mortal sin”)’ [196, p. 230] [200]

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