If I ran the university...

Chapter 8, *Seven Deadly Sins of Quantitative Political Analysis*[1]
Philip A. Schrodt

> Do not go gentle into that good night
> Rage, rage against the dying of the light.
>
> Dylan Thomas

This chapter is a relatively late addition to the manuscript. The origins began with my reactions to Steve Jobs's famous Stanford commencement address,[2] possibly the only memorable commencement address in human history, which was replayed endlessly following his death in October 2011, coinciding with some of my road-trip presentations of *7DS*. Jobs begins the address with a poignant story of having to drop out of an expensive private college on realizing his parents could never afford the tuition, but then how auditing one seemingly frivolous course would eventually change the world of personal computing. In a single life, the dark side and the light side of contemporary higher education.

Second, once I started thinking about these issues, I began noticing a rather large literature expressing similar views: Arum and Roksa [2011], Christensen and Eyring [2011], Ginsberg [2011], Keeling and Hersh [2011] are a small sample of what appears to be a burgeoning—and generally convergent—literature. In fact, the chapter was quite hard to finish because new material kept showing up in my day-to-day reading.[3]

The presence of a large number of academics and management consultants all saying the same thing does not, of course, necessarily mean that change is upon us: Consider, for example, the extended discussion of the inevitability of Japanese economic hegemony appearing in the years just prior to Japan entering two decades of economic stagnation. But, as I discuss in Section 7, I do, in fact, believe that "this time is different", and in

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[1]Contact: `schrodt@psu.edu` Supplementary online materials (SOM) will eventually be available at `http://7dsbook.org` and/or `http://eventdata.psu.edu/7DS`. Manuscript is currently available at `http://eventdata.psu.edu/7DS`

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[2]`http://www.forbes.com/sites/davidewalt/2011/10/05/steve-jobs-2005-stanford-commencement-address/`

[3]And then some! Literally six hours after I did the "final" edits on this chapter in April 2012, the *NYT* posts an article on a new $60-million open course initiative by Harvard and MIT, following closely on a similar effort—`https://www.coursera.org/`—by Stanford, Princeton, Penn and Michigan. The big dogs [and metaphors] are mixing it up in the alley, bucky! Decide whether you are going to play or stay on the porch: the train is leaving the station, and I'm betting it is going to travel a looong way, and it could be quite an exciting ride!

Section 1 I observe that historical patterns suggest that the dominant university model may be at a point where it will naturally undergo a period of radical change.

Finally, as I've noted at numerous points, this manuscript seems to be getting read by graduate students, and whether I'm right or wrong, these issues are going to confront you as professionals. And if I'm right, the future may be quite different than the past.

1   North American University Reforms

For a liberal institution that supposedly provides a societal memory, most academics know remarkably little about the development of the university. While universities are 3rd most durable human institution (cities and religions are 1st and 2nd; the relative ordering is contested), they have not been static. This has been particularly true in North America, where the relations between higher education and other parts of society in the post-colonial period were necessarily very different than those in Europe due to the absence of an established church and nobility—for centuries, key educational actors in Europe—as well as accommodations during the 19th century to an ever-expanding frontier.

For our purposes, three periods of change are important. These modify a colonial system consisting of a small number of urban institutions, generally modeled on English institutions.[4] I've identified the approximate date of the start of the changes; they generally took place over roughly a generation.

1820

This era first saw the establishment, in Thomas Jefferson's University of Virginia,[5] of one of the initial public "corporate" universities. Of greater importance in the short term was the proliferation of small liberal arts colleges—largely church sponsored—as part of frontier

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[4]There were nine: Harvard, Yale, Penn, Princeton, Columbia (originally King's), Brown, Dartmouth, William and Mary, and Rutgers (originally Queen's). To this day those institutions remain disproportionately influential: In 2004 both presidential candidates—despite amply demonstrating that they were not exactly the brightest bulbs in the box—graduated from the same elite university and even belonged to the same academic secret society. Confirming—or at least shifting the posterior—the proposition that the US is free but not democratic.

[5]This accomplishment, along with his phrase "separation of church and state," is presumably the reason Jefferson was removed from the secondary school history curriculum in Texas in 2010. So you folks down in Texas will just have to look up "Jefferson" in Wikipedia, and you may be surprised to learn that he made at least a few noteworthy contributions in the early history of the US. And, sorry to break this to you, but the earth orbits the sun, probably the next thing in the crosshairs of your Board of Education. And they are none too sure about this "gravity" thing—just a theory, you know.

Having lived with the notorious *Kansas* Board of Education for 21 years, you cannot imagine how much I enjoy writing these sentences. . .

settlement: Protestant evangelicals founded more than 40 colleges in Ohio alone; most have not survived but those that have include Oberlin, Denison, Ohio Wesleyan, Kenyon, College of Wooster and Antioch.[6] In general, however, these continued to follow the centuries-old classical Scholastic model.

In addition, there was a substantial increase in literacy due to government support of secondary education and the Land Ordinance of 1785. By the 1860s, this produced, for example, the first military in history with wide literacy among the rank-and-file, to the eternal graditude of historians and film-maker Ken Burns.

1880

This era is the most important from the perspective of anyone in graduate school: the German or Humboldt[7] model of the liberal "research university" begins to replace the classical Scholastic model which had dominated the European university system almost since its origin. It is easy to forget how recently this innovation occurred, and the remarkable fact that very little of the scientific revolution prior to the 20th century was based in the universities, which were bastions of conservatism in all respects. A uniquely U.S. manifestation of this modernizing trend was the establishment of the "land grant" institutions—inconveniently for my chronological scheme, by the Morrill Act of 1862—which expanded public higher education while providing a pragmatic research emphasis on agriculture and engineering.

1950

The post-WWII period in the U.S. brings us to the current situation. This saw a major expansion of higher education with public funding through the GI Bill and various grants and loan programs for students, and of university-based research through the National Science Foundation, National Institutes of Health, and very large expenditures by the Dept. of Defense. For the middle class, higher education went from being the exception to being the norm. By the 1990s, the research infrastructure was further industrialized, and the pursuit of profit-making investments enabled, if not actualized, by the Bayh-Dole Act of 1980. By the 21st century, elite alumni who had benefitted from rising income inequality would make individual contributions on the order of tens of millions of dollars.[8] The results were the

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[6]the last, only sort of. . . depending on how you define "survive."

[7]Wilhelm, not his brother Alexander, the explorer and naturalist.

[8]Most commonly for research infrastructure, but not infrequently, for sports facilities. In 2011-2012 Penn State, with the highest tuition of any public institution in the nation, and a scandal-plagued athletic program, accepted a $102-million contribution entirely committed to establishing an intercollegiate hockey program.

Hockey. Such a gentleman's sport. What could possibly go wrong? Rather like a drowning person accepting the gift of an anvil.

massive campuses with tens of thousands of students and research budgets in the hundreds of millions of dollars that are familiar today.

While the decision may or may not have been deliberate—and I'm not suggesting a conspiracy here, but at least *someone* must have considered this—democraticizing higher education through the combination of the expansion of the public university system, the GI Bill, and meritocratic selection through the ACT/SAT examination system was perhaps prudent for the elites of a country which, in less than 35 years, had given a very large segment of its population military training in during WWI, WWII and the Korean War.[9] And didn't have particularly good gun control laws. This situation would not be repeated in Iraq and Afghanistan, where only a tiny part of the population was trained militarily, and then subjected to multiple deployments into their 40s.

The arithmetically astute among you will notice that these major periods of reform and reorganization occur at a frequency of about sixty to seventy years, and that the last period of reform occurred about seventy years ago. This may be important. Particularly if we take seriously the historical pattern—see Ibn-Khaldun's *Muqaddimah*—observed in both dynasties and monastic movements that it generally takes about a generation to consolidate a reform, and then about two generations to screw it up to the point where the original reforms are meaningless and another cycle begins.

The situation is not static in between the reforms, and things good and bad have occurred, which are detailed in the SOM *The Boomer Legacy to Higher Education*. Boomers arguably improved the university on at least the following dimensions

- higher education temporarily became more meritocratic and less class-based;

- the university environment became safer by substantially reducing—if not completely eliminating—the age-old traditions of the departmental drunk and the departmental lecher (cf. *Mad Men*, but the targets are 18-year-olds);

- gender and ethnic diversity were increased;

- the quality of teaching improved and innovations in student feedback in the 1970s probably drove out—or at least provided significant warnings of—the truly abysmal teachers;

- there was some adoption of new technology in the classroom;

- a reasonably standardized 20th century curriculum was developed.

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[9]And due to demographics, nearly universal male conscription would continue until the early 1960s. Affecting even Elvis Presley.

These innovations and refinements (as well as massive investments) in the Humboldt model, had, by the 1990s, established the US system of higher education as preimminent in the world. Not bad.

2   Problems the Boomers created

> The complexity of our present trouble suggests as never before that we need to change our present concept of education. Education is not properly an industry, and its proper use is not to serve industries, either by job-training or by industry-subsidized research. It's proper use is to enable citizens to live lives that are economically, politically, socially, and culturally responsible. ...A proper education enables young people to put their lives in order, which means knowing what things are more important than other things; it means putting first things first.

> Wendell Berry

So much for the good news; now let us turn our attention to the bad. Otherwise known as "reality." By 2000, a variety of inter-linked weaknesses had accumulated in this system. In combination with new technological opportunities, these are likely to drive significant change in the near future. As noted earlier, most of these have been dealt with very extensively elsewhere, and thus I will give them different levels of attention; additional detail can be found in the SOM.
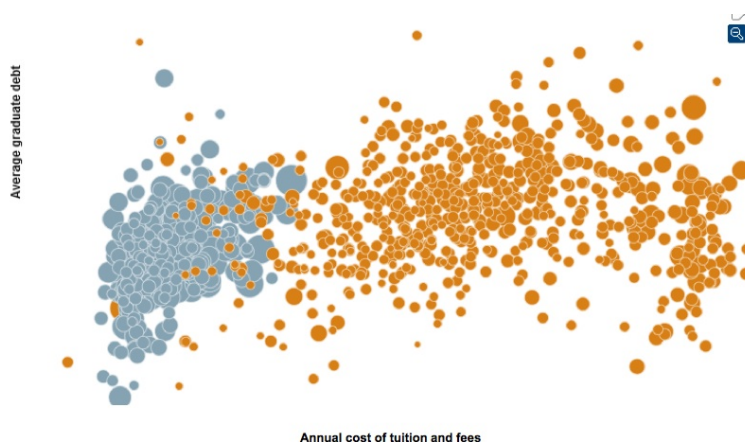
2.1   Cost

As has been amply documented, the cost of higher education has increased at twice the rate of inflation since 1980, the level of student debt has roughly doubled (in constant dollars) since 1990 and now exceeds the level of credit card debt, many students graduate with crippling levels of debt, [10] and elite schools are now out of reach of all but a tiny part of the middle class.

This change has been due in part to a factor the university could not control: the decline of public support as universities came to be viewed as a private rather than public good.

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[10]It must be noted, however, that many schools report that a substantial proportion of their students graduate with no debt at all: there is at least some element of individual choice here. Both Kansas and Kansas State, where one can get a perfectly good four-year education, reported about 50% of their students graduated with *no* debt in 2009. As did Indiana and Purdue. `http://projectonstudentdebt.org/state_by_state-view2011.php?area=KS`; the *NYT* data cited below provide th In these two states, the higher percentage of students with debt is found in the more marginal institutions, though these are presumably attracting students from lower income groups.That pattern did not seem to hold in the dataset as a whole.

But it is also affected by three factors the universities could have controlled but did not: the expansion of the university bureaucracies, the shift to developing facilities as comfortable but costly student-centered country clubs, and turning a blind eye—and sometimes actively encouraging—to the predatory marketing of student loans. The reckless disregard shown by some professors for the costs of textbooks which are, indeed, peddled by sweet young things in short skirts,[11] also has not helped.[12]

In mid-May, 2012, the *New York Times*[13] did a series of articles on student debt. While the article focused on outliers—the working class kids conned into taking out $80,000 in loans to get acquire a non-marketable four-year degree merely because "the campus felt right for me," the data suggested something more subtle. Figure 2.1 shows that the line relating cost to student debt is astonishingly flat when both public and private institutions are considered. Using the old and not terribly reliable "eyeball-regression" method, there is almost certainly an upward slope, probably close to 45-degrees, in the public schools, but with a large amount of variance, and essentially no slope at all for the private schools. Furthermore, Figure 2.1, which shows only those institutions where 25% to 50% of the students have *no* debt[14] shows quite a nice cluster—and these are schools of widely varying selectivity, geographical location and focus—where the average debt by those students who have debt is in the $12,000 to $22,000 range, which is probably a reasonable amount given the economic payoff. In other words, even in the current environment, there are clearly models where the institution has placed its priorities on the students, and developed a model which does not require large amounts of student debt.
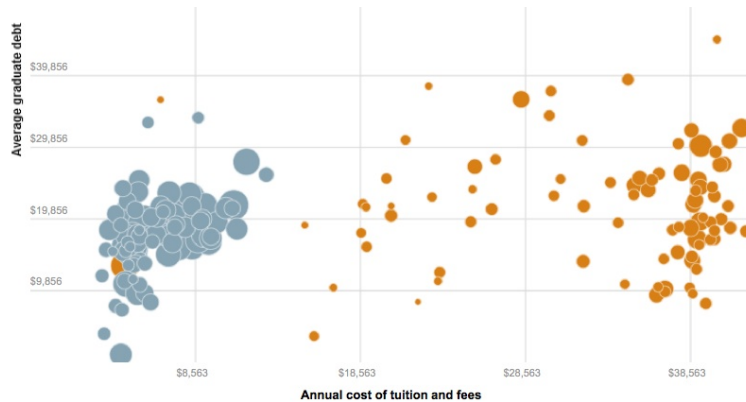
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[11]Followed closely by unsavory "textbook buyers" who roam the halls looking for laptops to steal.

[12]Most curiously, however, these prices seem to have peaked—at least in political science—after rising for decades, suggesting that there might be at least some price sensitivity in this market.

[13]http://www.nytimes.com/interactive/2012/05/13/business/ student-debt-at-colleges-and-universities.ht Grey points are public, gold are private.

[14]Only a small number of institutions are below 25%.

2.2 The Student as customer

Largely over the past three decades, universities have shifted away from the professional model of providing a service whose characteristics were determined by the provider—think any of the classical professions: law, medicine, the clergy and the military. . . the university was once in that list as well—to a model where the students (and the fee-paying parents whose little darlings can, of course, do no wrong) determine many of the key characteristics of the environment. Universities become less like monasteries and more like country clubs, grade inflation soars to the point where, by historical standards, grades are completely meaningless and every student is above average. "We pretend to teach and they pretend to learn." All reinforced by a highly successful (though partially self-inflcted) effort at terrorizing parents into making meaningless distinctions based on (easily manipulated) *U.S. News and World Report* [*USNWR*] rankings.[15] Keeling and Hersh [2011] discuss these issues in detail.

In contrast to the self-organized—if occasionally dysfunctional—student cultures of an earlier era, the "student as customer" model tries to create and control the student experience. This is justified by the totally irrational need to "maintain enrollments" in institutions that usually have at least two—if not twenty—qualified applicants for every person they accept. Excessive concern by professors in maintaining high scores on poorly designed (and fairly easily manipulated[16]) teaching evaluations has also contributed to this. Lavish dining arrangements, ever more sophisticated health club facilities, norms against holding exams

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[15]A commentator—probably it was Tom Friedman—recently suggested that for the global public good, Afghanistan should be required to post, on every potential invasion route, big signs saying "Welcome suckers." The *USNWR* publications should carry a similar warning. But seriously, it has been truly painful watching friends go through this intense process while knowing that the random choice of a first-year roommate will have far more influence on their son or daughter's college experience than a twenty or thirty point difference in *USNWR* rankings.

[16]Grad students and assistant professors: if you haven't learned these tricks, have a sympathetic older colleague explain them.

except on Tuesdays and Wednesday[17] all contribute to the "Club Med U" efforts, and a supporting bureaucracy of *Gentils Organisateurs.*

3   Incoherent management and governance

Near the top of any list of problems with contemporary higher education is the expansion of the bureaucracy, the proliferation of innumerable levels of deans, associate deans, assistant deans, deanlets and deanlings.[18] Their sole purpose: calling meetings, taking credit for work others have done, and deflecting blame for failures. Remarkably, this expansion of the levels of management occurred during a time when most organizations of comparable size and complexity were *flattening* their management structures, and consultants have been extolling the virtue of such agile organizations for decades. Universities now seem to aspire to become General Motors in the 1960s. We know how that turned out.

Faculty self-governance in the meantime is generally relegated to debating things that don't matter, antiquated and incomprehensible pathetic playgrounds—fiercely defended by those with nothing better to do—whose sole purpose is complaining and stymying reform. They are the Polish parliament in the 1700s.[19] We also know how that turned out.

We have nonetheless seen a massive expansion of degree options. These are implemented at the pace of a snail crawling through molasses—at Kansas in the 1990s, a new program required 14 levels of [generally useless][20] faculty review—but these are mostly fitted into a single 128 credit-hour/4-year framework.

This 1960s corporate model contributes—though probably does not completely determine—many of the other institutional pathologies I am identifying. It certainly drives up costs: upper level administrators are among the highest paid personnel in the university outside of the athletic programs,[21] as well as driving down the productivity of regular faculty. Multi-tiered management necessitates the substitution of flawed numerical measures—student teaching evaluations, *USNWR* rankings, quantity of publication in sacred journals (see Section 8)—

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[17]Exams on any other day would interfere with the established drinking culture. Tuesdays and Wednesdays are also out if a major athletic event occurs the previous evening.

[18]The academic equivalent of the Golgafrinchan "B Ark" of Douglas Adam's *The Restaurant at the End of the Universe*: Hairdressers, tired TV producers, insurance salesmen, personnel officers, security guards, public relations executives, management consultants, phone sanitizers. Which should make for a marvelously pithy little quote but, well, Douglas Adams doesn't always write that way. Google it.

[19]Or—frighteningly similar—the U.S. Congress in the 2010s.

[20]A new degree program in international studies that I proudly escorted through this governance gauntlet proved, when actually implemented by the program's first director, to have several internal inconsistencies, none of which had been caught in those reviews. It did not help that I was married to the aforementioned director, whose task was to clean up the mess.

[21]Lower level administrators are not—arguably they are underpaid—but make up for this in sheer numbers.

in place of knowledge about the strengths and weaknesses of the individual faculty and departments, and the exploitation of the cheap labor of GTAs and adjuncts to reduce per-credit-hour labor costs. As university administrators come to see themselves not as academic professionals but rather as corporate titans, they are more likely to listen to advice of consultants who claimed to have advised successful enterprises: The student, after all, is simply your customer. And your scandal-ridden athletic program?: you need a hockey team.

A nice segue to...

4 Degree-granting sports franchises

> American school reformers have been flocking to Finland to discover what makes their primary and secondary education so good. However, most of them fail to acknowledge that Finnish schools offer no team sports, which means no 'student-athlete' hypocrisy, no cheerleaders, no pep rallies, and no architectural shrines devoted to the cult of youthful athletic prowess. [I am] under no illusion that the Finnish model can be replicated here.
>
> Steven Conn, *Chronicle of Higher Education* 20 April 2012

It appears that my academic career will be bracketed by attending Indiana during the heyday of the nearly psychotic basketball coach Bobby Knight, and ending it at Penn State in the era of the unthinkably sordid Sandusky child sex abuse scandal [Patriot-News and Luciew, 2011, Mahler, 2011].[22] So—except that I am going to—don't get me started on the problem of the degree-granting athletic franchise, and the shameless exploitation of "student athletes" [Branch, 2011] while administrators cower in the presence of charismatic coaches and their thuggish alumni supporters.

Why should I care? Why not just let the kids have their fun? For starters, most of these programs—probably about 90% of them, but the true figures are closely kept secrets—lose money. Penn State football (and Kansas basketball) did not, but were time-bombs: Penn State's football amounted to—at best—about 2% of Penn State's $4-billion annual budget, yet the Sandusky scandal brought down the president, two of the senior executive officers, kept the Board of Trustees in turmoil for months, caused a thoroughly embarrassing (and nationally covered) student riot, demonstrated to the world the complete ineffectiveness of faculty governance, and led to a year-long high-profile investigation of how the university handles on-campus crime reports. And this only what we know so far. For what?

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[22]Redeemed by my years at Northwestern, which at the time effectively had no athletic programs, even setting a record for the longest consecutive losing streak in football, and Kansas, which ran highly successful yet squeaky clean basketball programs under Roy Williams and Bill Self, succumbing to corruption only when it attempted to expand this franchise into football, about the time I left. No connection.

When Taylor Branch uses the word "plantation" to describe the condition of the exploited ahtletes, one should take that word seriously. Europe has a thriving professional sports scene completely divorced from the university system (and arguably with better results): there are alternatives.

5   Decline of the humanities

Surprised? Actually, I believe this one, and yet over the past thirty or so years, I have watched the post-modernists succeed where the Puritans, the Inquisition, Hitler, Mao and Stalin all failed, destroying what was once the center of the liberal arts. Nice job, dudes! Everything is relative; there is no truth, no beauty, no ethical questions. And if you disagree, you're a fascist—the mean green meme as Ken Wilber [2002] aptly put it. There's nothing more to learn, so what do we do with the remaining 12 weeks of the semester? Undergraduate enrollments in the humanities have plummeted.

Like a great forest fire that dies once it has consumed all available fuel, post-modernism does not appear to have much staying power. It is not scholasticism. Or rational choice. The typical 21st century undergraduate, confronted with a post-modernist manically raving about Heidegger, Derrida and Foucault responds with "Meh…whatever…" not "Hey, sign me up!" Except those who plan on graduate school. And there, they [may] get a degree, but not a job: many a search committee, faced with eighty applications for a single position, start the winnowing process with the simple rule "Toss all of the applications from post-modernists."

Admittedly, this was accomplished with some assistance from an occupational focus at the expense of the liberal arts. But that could have been overcome—the ability to write coherently is at the top of the list for countless recruiters (or at least the people they are recruiting for), with research skills a close second. For almost a thousand years, the liberal arts filled that role, until destroyed in the academic equivalent of the purge of the Jedi, with those still believing in coherent thought and exposition exiled to swamps, desert caves, and ice planets.

6   Adjuncts [maybe]

Finally, the Boomers allowed the tenure system to be severely weakened, replacing a reasonably egalitarian[23] professional self-governance with a hierarchical staffing structure character-

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[23]Outside of the athletic departments, academic salary inequality was, until quite recently, well within the limits the Chinese Communist Party would have found acceptable, typically about a factor of five. Until

ized by a diminishing number of very well off tenured professors supported by an underclass of adjuncts and GTAs, most of whom will never get full-time jobs.
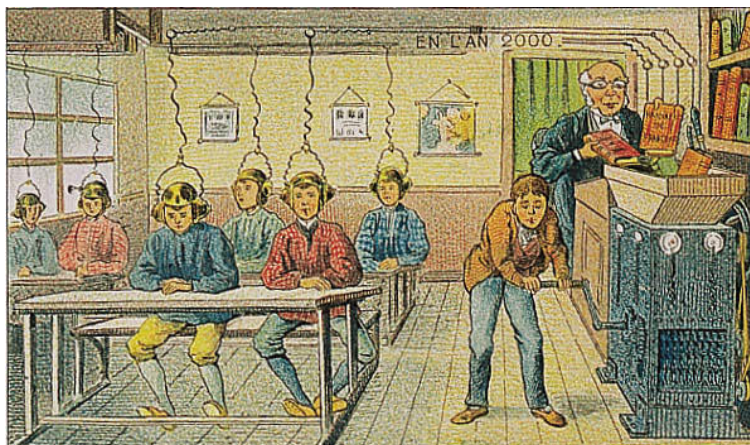
When done humanely—and Penn State is one place which does this—this process creates a group of teaching specialists, cuts costs and allows for smaller classes. When done inhumanely—the norm—it creates a combination of teaching by largely unaccountable amateurs and a class of bitter, insecure, and exploited individuals in a downwardly spiraling career desperately trying to piece together sufficient courses to pretend that they are still working in the profession they trained for. If they escape an early death by suicide or a commuting accident, they usually burn out after a few years, to be replaced by another generation of clueless institutional cannon fodder. Meanwhile voting for the [white] Perestroikan candidates for the APSA Council and spending a lot of time posting to Political Science Job Rumors.

Equally pernicious are the unnecessarily large graduate programs—far out of proportion to the number of positions actually available—whose primary purpose is to provide poorly trained cheap labor to handle a variety of odd instructional formats—notably the notorious "discussion sections" of introductory political science classes. In political science, generally these individuals figure out what is going on and leave after a couple of years—"graduate school" essentially having been a year or two extension of their undergraduate experience.

In the humanities, in contrast, it has led to the "professional graduate student": I served on a committee at Kansas which briefly considered the appeal of two students, one in history, the other in English, who wished an extension of the time available to finish their dissertations. *After twenty-five years spent in graduate school.* Both petitions were supported by their departments, citing the centrality of these individuals to teaching some critical courses. And my understanding was that both petitions were approved.

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recently, so was Chinese salary inequality. Even now it is substantially less than that found in industry.

7 The internet is not a film strip

> Anything that is in the world when you're born is normal and ordinary and is just a natural part of the way the world works. Anything that's invented between when you're fifteen and thirty-five is new and exciting and revolutionary and you can probably get a career in it. Anything invented after you're thirty-five is against the natural order of things.
>
> Douglas Adams, *The Salmon of Doubt* (2002)

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So, how are we going to get out of this mess? Invoking again the three-generation monastic/dynastic reform cycle, and—just in time—the *really* important technological change of the contemporary video-enabled internet—I think we may be on the verge of a new era.

Okay, now hold on, yes, I know this has been promised for *every* new communications technology since the late 1800s: the phonograph, movies, radio, public address systems, television, tape recorders, and multiple variations of computers in the classroom: remember the University of Illinois PLATO system from the early 1970s?[24] Even something called "the film strip", which integrated 35 mm celluloid film and the 33 rpm vinyl disk, originally developed for WWII training purposes.[25] Yet despite a century of technological development in instructional systems, in the first decades of the 21st century, higher education still generally involves the sage-on-the-stage, albeit with PowerPoint (previously we had overhead transparencies), asking students to read over-priced textbooks printed on dead trees,[26] and assigning grades to 3-credit hour courses based on the evaluation of blue books and term papers.

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[24]No, you don't, because it failed. But it was fun to program. In the TUTOR programming language.

[25]I think. For once—perhaps ironically?—Wikipedia is not helpful on this history.

[26]Except students *don't* read textbooks any more, to the point where bookstores and publishers have had to revise their models for the number of texts that will be purchased. But that is another story...

So why will the internet make things any different?

- It is pure information, and at least some of that information is knowledge; the remainder entertainment

- The marginal cost of access is zero for anyone who can afford a university education

- The marginal cost of duplication is zero

- The marginal cost of cataloging is zero, the cataloging is almost continually updated, and it reflects how the information is currently used, not some abstract system designed a century and a half earlier

- It is global

- It is asynchronous

- It is persistent

- It is current

- And we don't have to teach it

None of those earlier technologies combined these attributes. And this new technology has become available at just the point when the existing system of higher education has lost its way. The internet directly competes with the traditional university system as a source organized collective memory but without a costly bureaucracy nor the need to provide a fixed curriculum at a specific geographical location and at specific times. This is a big deal.

If I am correct, we are only at the very beginning of a set of major changes. Like all new technologies, these will take at least a human generation to fully implement, with many mistakes along the way. But as Thomas Edison [possibly] said "We will make electricity so cheap that only the rich will burn candles," something very similar may occur with the four-year residential degree, and it may well be occurring already. And just as Edison's electricity[27] brought light to households even as it marginalized candles, higher education has a bright future: it is only the archaic institutions and processes we have today that will be reserved for the rich.

What follows is my brief outline of how the problems outlined above will force major structural changes. The challenge is predicting—and in a changing technological environment no less—the right balance between the pressures for change against the unquestionable ability

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[27]Well, the alternating current systems commercialized through the efforts of Tesla and Westinghouse: Edison had advocated the use of direct current for household lighting, a dead-end.

of institutions, particularly large institutions that are well-networked at the elite level, to reproduce themselves despite all odds. Holy Roman Empire! Which is to say, half of these predictions are likely to be wrong, but I don't know which half.

History doesn't repeat itself but it rhymes.[28] That is, any institutional arrangement that has been stable in the past may, in response to technological changes, become stable in the future. This transition may possibly be a very rapid—think *Newsweek*, Blockbuster video stores, Borders, and Tower Records—displacement of the centralized public corporate university by the highly decentralized, diverse, and individualized teaching-focused models of the nineteenth—or even fourteenth[29]—century, a model where students[30] organized around a group of skilled instructors and read a pre-prepared curriculum of agreed-upon work. Except in the 21st century, instead of reading Aristotle, students will watch videos on artificial intelligence and machine learning from Stanford and MIT. The 20th century was the period of centralizing power; the 21st—thus far—has been a period of providing open collaboration platforms that will self-populate and self-organize. Facebook, Linux, Wikipedia.

The corporate university model is extraordinarily vulnerable to the internet-driven "aha" phenomenon where strengths are suddenly perceived as weaknesses, and "things are this the way they are because they always have been" doesn't cut it.

- Stores had a small but carefully selected stock surrounded by [expensive] bricks and mortar, and a staff who could [possibly] advise you on why that was sufficient for your needs. Online merchandizing is unconstrained in both selection and location—if it exists, you can find it and buy it, after reading the reviews—and can market to the entire world (well, anywhere with delivery services);

- Physical books are a nice experience, but so is the ability to browse a book on-line, purchase it for a couple of dollars, download it immediately to a phone, and have it available for those idle moments on a train, checkout line, or waiting for the dentist;

- The circulation of most newspapers and newsmagazines plummeted as global news and opinion became available 24/7 on the Web and high-bandwidth video cable. The newsmagazine *Newsweek*, which for decades, in competition with the now equally beleaguered *Time*, had been required reading for much of middle class, was sold in 2010 for $1.[31] The niche market of local newspapers lost one of their primary revenue streams,

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[28]Usually attributed, incorrectly, to Mark Twain.

[29]but not Scholasticism.

[30]Who did not demand 110,000 person stadiums, though they did drink a lot, and periodically rioted and destroyed property.

[31]The newsmagazine *USNWR*, once the conservative alternative to *Time* and *Newsweek*, was reduced to providing flawed rankings of higher education institutions.

the classified ads, to the astonishingly plain—and quirky—*Craigslist*, and many independent papers were bought by a national chains. The survivors were elite brands: famously *The Economist* in newsmagazines, whose circulation actually increased, and in the US, three large national papers, *New York Times*, *Washington Post* and *Wall Street Journal*.[32]

- The individual, downloadable music track replaces the 60-minute album on vinyl or CD;[33]

- Collaborative open-software has all but displaced proprietary software in a variety of core areas. These include Linux for back-end operating systems, though not the desktop, LaTeX for scientific document preparation, R for statistics, a series of compilers and scripting languages—gcc, perl, Python, Ruby—for software development, MySQL for databases, Firefox for web browsers, WordPress for blogging, Apache for servers, and Subversion for version control. Hardly a trivial set of examples. In any given field, most collaborative open-source efforts will fail, but only one needs to succeed.

The existing system of higher education is primed not for just one of these "aha!" experiences, but several, and that makes at least some change all but inevitable. If the alternatives were merely cheaper, change could be—and has been—resisted: higher education, as noted above, has proven astonishingly insensitive to price. But it will not merely be cheaper, it will be better, and that provides nearly irresistible incentives for change.

Web-based lectures and course materials

In Spring 2012, [former] Stanford computer science professor Sebastian Thune, and his collaborator at Google, Peter Norvig, decided to offer *Introduction to Artificial Intelligence* in an on-line format, open to anyone. Thune sent out a single email announcing this, and

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[32]This pattern of decimation, re-purposing, consolidation, and the dominance of elite brands in an industry focused almost entirely on information may provide a very close analogy for higher education.

[33]Illegal file sharing was a factor here, though not a pivotal one: Apple's iTunes almost effortlessly monetized an alternative solution and for its trouble made billions in profits. File sharing gained a foothold only through the legendary decision by major record labels that aggressively suing their customers was a good business move. In defense of the labels, advancement in that industry requires the consumption of such massive quantities of psychoactive drugs that it is a wonder that record industry executives can even stand upright, much less conduct a public relations campaign.

But there are two lessons from the demise of the record industry which may be relevant to higher education. First, like the universities, the music labels thought they were irreplaceable because of a reputation for quality and the ability to nurture new talent. We know how that turned out.

Second, from the perspective of the undergraduate, the album and the 4-year degree have much in common: A small number of good experiences that justify the purchase, but packaged with a great deal of crap that was included largely to fill up a fixed amount of time and support a parasitic corporate structure.

expected to get a few hundred students. He got 160,000. By the end of that course, about 250 students scored perfectly on all of the quizzes. Not one was from Stanford.[34]

At the same time, a series of short videos on basic concepts of secondary school mathematics, collectively known as the "Kahn Academy," originally developed by an engineer to help a younger cousin and made available—why not?—for anyone on the Web, are revolutionizing mathematics instruction.[35] These provide self-paced learning where the traditional norm of classroom lecture and individual homework is replaced with lecture "homework" and individualized classroom instruction. As of April 2012, it has 3100 lessons.[36]

While it is easy to dismiss these as just the two latest variations on the film strip, my sense is that with suitable refinement, they will become the new norm. The Kahn Academy, while at the secondary education level, seems to have hit the formula for effective instructional use of the Web: videos which break the subject into small chunks, asynchronous pacing, with each student learning as quickly or slowly as appropriate for actually *learning* the material, not merely witnessing it, along with automated evaluation, and the use of a combination of web-mediated study groups and individual human tutors to help students get through the rough spots. Thune and Norvig are simply the latest and most conspicuous effort to adapt this to higher education.

Assuming this model generalizes—and based on my 35 years of teaching statistics, everything about the Kahn Academy suggests it will produce a *better* outcome, not merely a more efficient outcome—we can readily extrapolate the implications. The sage-on-the-stage is going to be replaced by some very-low-cost—probably, like a major collaborative open-source system, free—network of web-based lectures and textbooks.[37] The cost of creating these will be subsidized by the value-added to the brand for the major producers (well-known universities such as Stanford, MIT, and Penn State[38] or—possibly—new institutions devoted exclusively to this task, Western Governors University being a possible prototype), contributions by large foundations and wealthy donors whose objective is to provide public goods—the Bill and Melinda Gates Foundation, Google, and venture capitalist John Doerr have contributed significantly to the Kahn Academy—and by the accumulation of a very large number of small contributions by people who simply enjoy doing work that tens of

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[34]http://blogs.reuters.com/felix-salmon/2012/01/23/udacity-and-the-future-of-online-universit

[35]Which, trust me, seriously needed a revolution.

[36]http://www.khanacademy.org

[37]As of April 2012, the buzz-phrase was "massive open on-line courses," which may or may not stick, though I'm guessing it will.

[38]Which in the 98% of the university not devoted to covering up child abuse in the name of moving leather objects across 1-acre fields during autumn—and one spring—weekends, has committed very substantial resources to distance learning. Though to date, probably in no small part due to the distractions of the aforementioned activities, has yet to devise a strategy on MOOC.

thousands of other people will use, and which enhances their own reputation.

Are students truly willing to give up the exciting interaction of the classroom for a mere video? In the 50 to 500 student classrooms of the contemporary public university, probably. At least with a video, you can rewind to repeat the parts you missed the first time. And the level of direct interaction with the lecturer is about the same.

We are seeing a similar trend in textbooks: Google the phrase "open source textbooks" and you will see a number of projects, large and small, some supported by major foundations, some only by a dream. For textbooks whose content is largely static, only one of these projects needs to succeed: High school geometry textbooks are merely [expensive] glosses on Euclid's *Geometry*, assembled more than two millennia ago, and the process by which oxygen and hydrogen bond to form water is not likely to change any time soon. For textbooks whose content is dynamic—political science, for some reason, comes to mind—Wikipedia is the potential model and again, could provide a product that is not only cheaper, but better: Were such a project in place, analyses of the Arab Spring would have been incorporated into comparative politics textbooks within days, not months, and continually updated. And while the collaborative open source textbook may not be quite as slick, or quite as consistent, as the commercial product that has gone through countless editorial revisions, publisher-dictated tables-of-contents[39], external reviews, focus groups and marketing markups,[40] they will be [infinitely[41]] less expensive and students will have no financial excuse for not reading them.

Nor—beyond the not-insignificant efforts of the large corporate interests to preserve through restriction legislation what they can't achieve in a competitive market—is there any reason these efforts could not be funded as public goods. Since WWII, government and foundation funding has paid for everything from determining the size of the universe to performance art; there is no practical reason these sources could not fund open-source textbooks as well.[42]

But what will textbook authors do?!? At present, this is an extraordinarily inefficient market: "Marketing"—the aforementioned sweet young things in short skirts—and various

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[39]Evolution and climate change? No, please, we do not want that. Mere theories. Very discomforting. Please.

[40]And despite all of this review, still contain a surprising number of errors or, more commonly, inconsistencies. Which the occasional students who actually read the text will find. At 2 a.m. on the night before the midterm. At which point they become very upset when their email to the instructor is not answered immediately.

[41]Do the math. . .

[42]While I *fear* the political machinations of the publishing industry, the reality—following the experience of open-source software—will likely be more mundane. Free, if somewhat flawed, open-source efforts will quickly absorb so much of the market previously occupied by ponderous and hugely expensive proprietary solutions that the latter will collapse, possibly quite rapidly. In open-source software, this took only about ten years once effective collaborative models had been established.

other unaccounted-for charges by publishers consume most of the profits, the used and rental book market wipes out most of the rest, and only a very small number of academic authors make any substantial amount of money for their efforts. In the meantime the amount of completely wasted effort is phenomenal, and would be much better spent on open-source collaborations which would at least see the light of day. Do not confuse the returns to textbook authors with those to Stephen King or J.K. Rowling.[43]

As with open-source software development, most collaborative textbook projects will fail.[44] But provided the material is produced under an open license such as Creative Commons, it only needs to succeed once: For example, open source needs only a single instance of a really good exposition on how to correctly interpret the t-test on a regression coefficient, not a new edition every three years.[45] Euclid—or, far more likely, an open collaborative group writing as "Euclid" over the course of a century or so—constructed a pedagogically coherent presentation of geometry which could be successfully taught to teenagers, and we're still using it 2,300 years later.

Unbundling the Degree

At the end of your four-year degree program, what you do have to show? A transcript, yes, and at any institution, a transcript showing classes with titles containing the words "Differential Equations" and "Advanced Conversational Chinese" will send a different signal than

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[43]I won't dismiss the possibility of the for-profit textbook entirely. But just for a radical idea, folks, maybe think about self-publishing? The typical textbook royalty is 12.5% on the list cost. A typical text these days retails for about $40 on Amazon (except statistics texts, which list at $100-$150—I'm not making this up—downside being that students increasingly refuse to buy them); you get $5 from that. Produce your masterwork—sure, it will be a bit less slick than the commercial version—and price it at $10, twice your return from the royalties (all that marketing is presumably worth *something*, right? Right?) and see how it does. There's at least a chance you will make the same amount of money—and you can update the text whenever you like—and the copies won't get into the used book market but the students save still save $20 - $30 despite that, and at least some students might buy it when otherwise they would not. Keep track of the numbers, and maybe we can get a nice little natural experiment going here that we can publish in *PS* or some micro-economics journal someday.

[44]I'm partly responsible for one...

[45]The stability of open source over time may be one of its hidden strengths compared to commercial products. This comes from two sources, the obvious difference that open source has no motive to produce something "different" just to drive sales and training, and the decentralization of open source projects makes it difficult to coordinate major changes. I have an old Unix reference card I made when I was first learning the system in the early 1980s, and all of the commands still work, whereas the Microsoft *Office* suite goes through major revisions—some good, some bad—every two or three years.

Open source appear to exhibit a process of "punctuated equilibrium"—evolution by jerks rather than evolution by creeps—where major new changes are introduced as an entirely new system: consider, for example, Python versus perl. The older systems remain useable, which is advantageous in research communities where some software may have a useful life measured in decades, as opposed to front-end business environments where there is a high turnover in personnel anyway, and most products—memos—are produced for only the short term.

those containing the words "Derrida" and "Sports Administration." But beyond that, you mostly have the one or two institutions where you did that coursework, be it Harvard, State U. or SouthEastern Redneck Community College at Feed Lot. That choice of institution depended on some comnbination of

- your geographical location, particularly your citizenship and visa status;

- your family's financial circumstances at age 17, and the availability of financial aid at various institutions;

- how impressed you were with the rap video some enterprising students put together as part of the institution's recruitment web page;

- for the upper-middle-class, memories from an endless series of carefully orchestrated campus visits which began at age 15 and provided roughly the same level of useful information as a North Korean patriotic film;

- the chance that you didn't get the flu or break up with the love of your life the night before you took the SAT;

- whether you had just the right combination of extracurricular activities and professionally-written essay to catch the attention of an admissions officer who knows absolutely nothing about your eventual major;[46]

- in a process that is entirely zero-sum: your admission taking a place away from someone else.

That's insane! It seems as silly as confining your choice of movies to whatever is left on the rack at [the now departed] Blockbuster video store.

Aha! Why, in the 21st century, should you take courses from only a single institution? Take a core curriculum—pretty much anywhere, even SRCC/FL—that provides you with the foundation for more advanced coursework. Then go for the instruction best suited to your skills and interests. If this means combining a machine learning course at MIT with natural language processing at Carnegie Mellon and Bayesian statistics at Stanford, that will seem perfectly ordinary. In fact doing all of your work at a single institution will seem as antiquated as doing all of your work with a single professor.

In this brave new world, you get to do your best, and your test yourself against the best teachers (and students) that can be found anywhere. Substantially more meritocratic.

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[46]And by the way, chances are you also don't know your eventual major.

Meaning it will be fiercely resisted by students and universities, but welcomed by employers (except when it involves their own kids). In the economic current environment, I'm betting on the employers winning.

And while we are unbundling, what possible justification is there for a single "four-year"[47] model to encompass everything from comparative literature to trumpet virtuosos to accounting majors? Different disciplines need different amounts of training, as one already sees in graduate education. I am completely unconvinced, for example, that a four-year computer science degree is the best way to learn programming—a skill in high demand, but best learned by experience once a few fundamentals have been mastered. Nor, quite possibly, data analysis. So long as the transcript is transparent and the grading honest, let the outcomes determine whether the training was appropriate.

The Return of the Teacher/Tutor

One-on-one teaching, or at least small classroom teaching, in some form, probably individually paced in many instances, returns to the forefront. As does the long-suffering free-lancing adjunct, skilled in teaching and accounting for most of the actual student contact hours, who ceases to subsidize the tenured faculty member who is working 1200 hours a year (if that), may have marginal teaching skills,[48] and produces articles that no one—including people within their own hyper-specialty—ever reads.[49] The core requirement for a good teacher will be, well, that they have to be a good teacher.

Much of this instruction will probably be on-line and decentralized: we are already seeing quite a bit of this. That approach—as well as on-line study groups, usually self-organized— seems to work, and frankly it has been years since I've seen students coming to "office hours" even in a residential college.[50] But over the course of the semester I'll answer hundreds of emails.

Residential tutoring—which given the current state of US secondary education, probably will still require a year or two before a student is ready for advanced on-line work—would still be important for two sets of skills imparted by the traditional, pre-post-modernist, liberal arts curriculum: expository writing, and research skills, the second completely transformed

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[47]Five, six, or infinity, more commonly

[48]Maybe, not necessarily: good researchers are not necessarily good, or bad, teachers: the skill sets are distinct and orthogonal, contrary to academic folklore.

[49]Same story, in all likelihood, for the inexperienced GTA who inexpensively teaches a discussion section which has zero added educational value. The GTA concept is probably doomed, as any course that can be taught in a large lecture format can be taught on video. With the demise of the GTA, we will see the demise of hundreds of marginal and exploitative "graduate programs" whose sole purpose was to supply GTAs. No loss there.

[50]Except to complain about grades, the sole residual function of the practice.

by the Web but still requiring some practice and instruction. At present, at least, it is difficult to either teach or grade these using automated methods—limiting the scale of any on-line efforts to teach these—though that may change in the future, as least at the basic level, much as has occurred with foreign language programs.[51] A small number of fields absolutely require physical presence—chemistry, theater, and dance come to mind—and will probably retain their residential character.

An open issue is what becomes of classroom discussion in the social sciences and humanities. In the large public, credit-hour-driven universities, that horse left the barn long ago: Only the most skilled instructors can conduct a discussion involving most of the class when dealing with 40 to 50 students, and this occurs so infrequently that students do not develop any facility—or appreciation—for the task. Typically, one is lucky to get 20% of a class participating, and they are not necessarily the 20% with the most to contribute.[52] The situation is probably brighter in the smaller liberal colleges, likely beneficiaries of the new model. Active learning, when done well, has tremendous advantages; the problem is that it usually isn't done well. And obviously different subjects are going to have a different mix of residential and distance components.

Still open is the question of whether the academic norms of "discussion"—a hold-over from the *disputatio* central to Scholastic instruction in the Middle Ages—has any relevance outside the classroom. It is worth noting that Socrates and Plato made a not-unrelated critique of the Sophists on this score about 2,400 years ago.

Independent and transparent evaluation

This last major change is the one least implemented to date, though with quite a remarkable number of parallels and precedents: Split the tasks of instruction and evaluation. This will have several positive effects. First, it removes the conflict of interest that has thus far corrupted most for-profit institutions into becoming semi-criminal enterprises devoted solely to the extraction of funding through student loan programs.[53] Second, if institutions can be somehow forced to provide transparent accounts of their success rates—which you can be sure will be massively resisted—it provides accountability.

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[51]Not to the level of fluency, but at basic levels. There may also be a parallel here in the introduction of automated news writing to generate routine low-priority stories in areas such as amateur sports and local business. `http://www.slate.com/articles/technology/future_tense/2012/03/narrative_science_robot_journalists_customized_news_and_the_danger_to_civil_discourse_.html`

[52]Traditional discussion is, obviously, also impossible in asynchronous learning environments.

[53]`http://harkin.senate.gov/help/forprofitcolleges.cfm`, `http://www.help.senate.gov/hearings/hearing/?id=19454102-5056-9502-5d44-e2aa8233ba5a`. Arguably, in the guise of grade inflation, the not-for-profit sector has failed miserably on this dimension as well.

Disentangling instruction and evaluation should end grade inflation. And the need for teaching evaulations: Prof. Jones is demanding and has a quirky personality and a funny accent, but her students have twice the success rate of that lovable if chronically stoned Prof. Smith, so sign up with Jones as your tutor. The ability to credibly and independently validate student accomplishment will again benefit the smaller institutions which have returned to something resembling the older tutor[54] model. Facilities that can provide confirmation that the person taking an exam—at least the "final", not necessarily every quiz—is in fact who he or she claims to be are an essential component to providing credibility for distance learners. The fact that this means the possible elimination of the part of the job that a number of professors consider most distasteful is, well, gravy.

The separation of instruction and evaluation, while difficult given the ubiquity of the existing system which generally combines the tasks, is not without precedent. The ACT/SAT system and their professional analogs such as the GRE, LSAT and MCAT provide nationally-normed evaluation, however flawed. External evaluation of university exams required for graduation is the norm in Great Britain, and national evaluation at the secondary level has long been the norm in most national systems.[55] China's meritocratic bureaucracy was selected by examination beginning in the seventh century CE, a system later adopted in Korea and Japan. The legal profession already uses the external evaluation model. The International Baccalaureate for secondary education provides another model, driven in this instance by parents who wish to demonstrate that their children learned something in high school beyond football, creationism and self-esteem. Placed in historical and comparative context, the remarkable thing about the existing system is not that it could be replaced, but that it has survived as long as it has.

Just a couple more observations

- Deprived of a guaranteed supply of fee-paying undergraduates, the large public research universities will begin to resemble European research institutions, though they will undoubtedly seek—probably with some success—to create "colleges within the university" that can provide tutoring services and residential degree. A relatively small number of institutions, probably largely in the elite private schools, and a few innovative publics, some like the new Western Governors University possibly designed *de novo* under the new model, will provide most of the teaching materials. We see this transition underway already. This will, however, leave a large number unused

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[54]Not Tudor: that we can do without. . .

[55]And has been introduced—ironically in order to evaluate the school, not the students—through the "No Child Left Behind" legislation in the U.S. Again for better or worse.

500-person lecture halls.[56] Though appropriately repurposed for accessibility, vacant dormitories should make nice assisted-living centers for the Boomers.

- In an environment where students will go through a program as quickly as their intelligence and effort allows, and much of the fee-paying is done by students thousands of miles away, money-losing athletic programs become what they were all along: completely unrelated to higher education. The chimerical "student-athlete" will be relegated to the "Who did they thinking they were fooling?" category of history, along with the "separate but equal" schools of the Jim Crow South. Regional sports teams will develop on the club model of Europe, or the semi-professional model of pre-WWII North America. Where we can hope that the athletes will have at least a modicum of bargaining rights, which they do not have under the NCAA. Still need an autumn Bacchanal? Go to Burning Man.

- And the bloated bureaucratic superstructures of associate deans, assistant deans, deanlets and deanlings? Guess they will have to call a meeting. Or get on board Ark B.

7.1 Really, you think all of this can change?

The reason a lot of people do not recognize opportunity is because it usually goes around wearing overalls and looks like hard work.

Thomas A. Edison

One of the [several] periods of doubt as I was writing this chapter came when I was enscounced in a hotel across the street from a massive Midwestern state university campus, looking out the window at a physical infrastructure that seemed to stretch to the horizon (it was an ag school) and tens of thousands of students hurrying—well, moseying, it was in the spring—to classes. The inner voice of doubt said "There's too much here...it can't possibly change..."

Or can it? While projecting an outward patina of permanence, US higher education has always been quite open and dynamic. Hundreds of liberal arts colleges have been created and died, major new public universities have been established even in the past two decades, and as I discussed in Section 1, even the fundamental models have changed, most recently with the proliferation of community colleges. Furthermore, except in the instances where professional

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[56]For decades, under the edict of a possibly far-sighted provost, the University of Kansas severely restricted the number of large lecture halls, forcing most courses to be taught in smaller sections. Then, showing the state's proverbial exquisite timing, reversed that policy at the beginning of the 21st century. Kansas, poor Kansas: see Frank [2004].

associations have established a monopoly position—law, medicine and education—multiple parallel systems can co-exist, and have for decades. "Creative destruction" has operated. Accreditation is helpful—though with external evaluation, outcome transparency would be more efficient, less easily gamed, and more valid—but in the end, an acceptable degree is any degree someone will accept.

For all of its appearance of permanence, the actual university is remarkably transient. Most critically, its student clientele experience almost a 100% turnover every five or six years, a rate of change found in few other service organizations.[57] Universities famously have almost all of their costs in their personnel, and these completely change every thirty to forty years.[58] The university very much epitomizes the old joke: "This is the same ax my grandfather used. 'Cept it's had three new heads and five new handles."

The open question is how long this will take to occur. The "obvious" answer—particularly as one looks at the massive physical plant of the corporate university—is that the existing system took generations to build, and hence it will take generations to tear down. The corporate boards of *Newsweek*, Borders, Blockbuster, Tower Records and shopping malls doubtlessly had the same discussions:[59] this is whistling past the graveyard.

Critical to the transition—and frankly I don't know the answer to this—is whether a successful new model institution could be created by an individual with a radical idea and the ability to create a network to implement it: a Steven Jobs, Linux Torvalds, Michael Dell or Jeff Bezos. Or do the parts need to be carefully designed to interact properly?: no one has designed an open-source jetliner.

To date, the proprietary efforts have failed. These have either involved semi-criminal bottom-feeders or wealthy one-hit-wonders with little or no actual experience in education who are convinced that the entrepreneurial implementation of a simple idea—typically variations on "student as customer" and/or decentralized content provision—will make them billions. There are, in fact, billions to be made by removing the existing inefficiencies in the system. But probably not by bottom-feeders and clueless capitalists. But if the likes of Stanford, MIT, and Penn State try this, possibly out-sourcing some aspects to the private sector...aha!

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[57]Which doubtlessly accounts for the almost farcical efforts at indoctrinating students into the institution's "traditions," which they typically encounter for, well, five minutes in the convocation which precedes the beginning of classes in their first year, and for another ten minutes at graduation. And the next sixty years at football games, but as I've pointed out, those have nothing whatsoever to do with the university as an educational institution.

[58]Except for the lady in the back office of the graduate school who checks on the proper formatting of dissertations, who has inevitably been in that position since the Late Pleistocene.

[59]As did the skilled English textile workers of the early 19th century: we know how that turned out. `http://en.wikipedia.org/wiki/Luddite`

The high level of variety and decentralization already present in the North American system suggests that higher education may be closer to a bazaar than a cathedral, and thus more open to sudden innovation than is first apparent. It may also come incrementally: clearly some fields are more suited to distance learning and autonomous evaluation than others, and once employers are convinced that students with such degrees are as qualified—or potentially, *more* qualified—than students from the 4-year residential programs, the huge advantages in time and cost involved in the new model programs will attract the serious students, forming a positive feedback loop, with only the wealthy, intoxicated, and party animals continuing to prefer the older 4-year residential model. Successful experimentation will gradually expand the initial successful model[s] to other fields, at some point reaching a limit.

Most likely, options at a variety of costs and levels will develop. With access to the internet, you can download Linux on a laptop in a cinder-block hut in Africa and learn to use it from material on the web. Or in your glass-and-aluminum office tower you can contract with a company that provides customized Linux solutions, have them give your staff five-day training seminars, and provide 24/7 support lines. It's Linux either way; the only difference is that the self-taught African will understand the system better.[60]

Change, of course, will be *fiercely* resisted. First by the academics: there are a lot of students (and administrators, and probably more than a few faculty) who really *like* the existing "we pretend to teach and they pretend to learn" model. So at least some of the change is going to have to come from outside, as the existing university will be hugely resistant. One only needs to look at the situation of legal education, which is highly vulnerable to a transitions because of costs, a well-developed external evaluation system, and the near-irrelevance of the law school curricula to that evaluation, but which is, at least for the moment, still sustained through monopolistic rent-seeking and reputation.

Nor will the response be uniform. Stanford, perhaps surprisingly, was sufficiently unhappy with the Thrun and Norvig on-line course that Thrun left his tenured position at the end of the semester to found an independent company. MIT, in contrast, has made course materials openly available for more than a decade. Penn State is aggressively developing distance learning, though still within the context of traditional models.[61]

Any large, established institution of higher education—public or private—*should* have

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[60]Okay, okay—enough with the analogies to open-source software! Sorry, it is the world I know. That and the university.

[61]For idiosyncratic historical reasons, Penn State had a decentralized system even before the internet, with almost half of its students dispersed across 18 widely-separated branch campuses, yet all receiving a "Penn State" degree deliberately indistinguishable from those awarded to students at the main campus at "University Park" (a postal substation in State College, Centre County). This may or may not generalize.

an edge in this process: they already have the brand, the faculty expertise, and much of the required infrastructure. But they also are most threatened by the change, and have the existing bureaucracies—and faculties—to resist it. What will happen, obviously, is that some will change and thrive, others will resist and, ever so gradually, die. Nothing new here: the same process occurs with every major technological innovation.

And as with other technological innovations, there will be strong resistance from elites in the society as a whole as well—that, by the way, is most of you reading this—who have every interest in cementing into place the structural inequalities of the status quo, having successfully defeated the attempted democratization of higher education in the 1950s and 1960s with the combination of the expansion of the public system and the opening up of the elite system.[62] The horse cavalry in the 20th century [Katzenbach, 1971]. Elite education is a positional good and the entire point of positional goods is scarcity: one doesn't want them to be widely available.[63] Though that doesn't mean we have to like this state of affairs, or encourage it.

7.2   How the future will work

Fast forward to 2050. Higher education has ceased to be a monolithic hierarchy and has split into multiple—but compatible—modes, united by the availability, at little or no cost, of a set of course lectures and textbooks available to anyone on the Web. Students work with this material at their own pace, time and place, and are assessed—for a reasonable fee—by independent evaluators. The very best students can complete and be certified in all of the material required for the equivalent of an undergraduate degree in a few months, though most will take longer. The coursework required for mastery of a particular field will differ widely, rather than following a single four-year model, and the norm will be for individuals to augment their education by acquiring new skills or updating old ones throughout their working life.

More commonly, students will be involved full time for a couple of years mastering written exposition at a level longer than a Tweet and the ability to do independent research; skills typically requiring extended feedback that cannot, as yet, be reliably provided by a machine. These skills will be provided by teaching specialists who, likely as not, will find it useful to

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[62]Though it is interesting to note that an absolutely core feature of the 20th century elite academic system—assortative mating—has been very substantially weakened as elite marriages now occur well beyond college age, and college is no longer the critical route to the "Mrs degree" as it was in the 1950s and 1960s. The same may be occurring with the critical issue of elite networking, once another major function of the university experience. If there is anything that the internet is changing, it is networking.

[63]"In economics, **positional goods** are products and services whose value is mostly (if not exclusively) a function of their ranking in desirability by others, in comparison to substitutes." Wikipedia, 10 April 2012.

combine their efforts in small institutions, some of which may be residential, some following the old liberal arts college model of the 19th century, some following the community college model of the 20th, and some utilizing the vacant space in the corporate universities of the 21st century. A relatively small number of very expensive elite institutions will persist as reputational signals and gate-keepers for the wealthy, as they have for the past eight centuries.

The corporate public universities will be substantially downsized in terms of their undergraduate populations, and in most instances shorn of their professional sports franchises. These will focus largely on research and graduate training. Graduate school will generally follow an apprenticeship model with only a limited teaching component if the student intends to do research, and an emphasis almost exclusively on teaching (probably in specialized institutions outside the research university) if they plan to teach. Professional schools will gradually detach as they succumb to decentralized certification—returning to an earlier norm where these were often independent—with the likely exception of medical schools with their large research components, though these are already generally autonomous in most institutions (and curiously, don't have sports teams).

8 The journal model is broken. . . let us count the ways. . .

Outside of teaching, keeping deans amused, and contract research, most of my professional labor is directed to the production or evaluation of work that will eventually appear—partitioned neatly into 8,000 to 10,000 word chunks—in academic journals. This is the typical pattern for individuals doing technical work; the alternative model of writing books—which at the elite level will total dozens over the course of a career—just hasn't been my path [Schrodt, 2004, Preface].

Given that, let me observe that the journal model is one very sick puppy, and is probably not long for this world. In this section, I will focus on three major concerns

- The review and editorial process has been overwhelmed;

- Resulting in a peer review process biased towards selecting only lowest-common-denominator articles which are only published after a long delay;

- An utterly shameless proprietary media which abscond with 100% of the intellectual property rights in exchange for adding 1% to the value.

One sick puppy indeed. Like the over-priced and over-bureaucratized degree-granting sports franchise and leisure club, it can't last.

8.1   Losing the race against time

Sure, 90% of science fiction is crap. That's because 90% of everything is crap.

Theodore Sturgeon

I recently received the following email from a journal where I serve on the editorial board. I'll leave the identity anonymous, suffice it to say this is a major international relations journal with a 8.5% acceptance rate and is consistently in the top 10 in the Thomas-Reuters impact scores. Which is to say, the sort of journal we should be concerned about.

> Most editorial time these days is devoted to chasing reviewer commitments and then waiting for/encouraging them to actually deliver a review. The difficulties in securing enough reviewers to make the process work cannot be exaggerated. In some situations, we have asked 10-12 people in order to obtain 2 reviewers on board (although these types of cases are not yet the norm). The number of reviewer invitations that were extended numbered 1,614 this past year. Over a thousand (1,052) reviews were received.

> ... The total number of manuscripts represents a 21.7 percentage increase over 2009-2010 figures. But keep in mind that the 2009-2010 submission numbers represented a 24.2% increase, just as the 2008-09 submission numbers constituted a 31.5% increase over 2007-08. All in all, submissions have doubled since we began editing three years ago. ... The trend line is quite clear. Since 1999-2000, the increase has been about 357%.

> ... [After] a 20 percent increase in space that began in 2009, we were able to bring the backlog down to 1.5 years but we were unable to keep it at that size. [We] watched our backlog move to 1.75 years and inch back towards 2 years this past year.

The editors of all of the major journals have similar stories. And so let's start by stating the blindingly obvious: this is completely unsustainable. Just do the math.

Why now? My guess is that there are at least three factors operating here. The first is an historical trend that I've watched throughout my career: Departments and deans have

continually raised the ante for hiring and tenure. At Penn State, we quite literally expect our grad students—who generally are competing for jobs at highly ranked programs—to go on the market with a publication record that would have gotten most people tenure when I entered the market in 1975. As I noted in Section 6 this has been made worse by the proliferation—far in excess of demand—of graduate programs that exist largely to provide low-cost labor in the form of GTAs.

These expectations are not just for publications, but publications in a very limited number of "quality" venues, this having become the low-cost substitute for evaluation—reading the candidates work, imagine that!—in the hiring and tenure process.. In political science, this usually means the sacred "Top Three" journals, with occasional allowances for the "Top Five" in international studies. In other fields, acceptable venues are limited to journals with the highest impact scores.[64]

There is, alas, quite a parsimonious model of why this has come about based on the trends discussed in earlier. Universities can get away with raising the barrier to tenured positions because those positions are disappearing: simple supply and demand. And the rise of the multi-layered bureaucracies—and corporate norms more generally—puts a premium on numerical measures: your Dean has no idea who you are, or what you do, and isn't going to find out, so—transferring the corporate aphorism that "you can't manage what you can't measure"—he or she needs some vaguely justifiable measure. Rather as Robert McNamara transferred the quantitative management methods he had developed at the Ford Motor Co. in the 1950's to the management of the Vietnam War in the 1960's. We know how that turned out.

More articles are desperately chasing a constant number of desirable slots, a classical

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[64]Another "unintended consequence" of this focus on simply counting articles—the article as commidity—is the totally irrational standardization of article length. This is now fixed at around 30 manuscript pages or 8,000 to 10,000 words irrespective of content, an approach which is completely different from the natural sciences, where articles differ substantially in length. This has at least the following pernicious effects

a. In fact most technical articles can be summarized in many fewer pages, but instead are padded with completely superfluous and ponderously-written literature reviews when a simple list of citations would be sufficient, as well as a "this is what I'm going to do. . . now I'm doing it. . . this is what I've done" style; this is actively encouraged in some graduate programs.

b. Since journals are still a zero-sum exercise dependent on the printed page, this completely useless material—most literature reviews are outdated by the time the article appears in print, typically about three years after the review was written—crowds out the publication of many novel results;

c. Numerous small but interesting results never make it into the literature because the author can't figure out how to expand these to the required length;

d. Since researchers aim for the long article format, they usually begin with about twice as much material as they actually need, and what finally ends up in the published article is typically the least controversial results (the availability of on-line supplementary material is alleviating this problem somewhere);

e. Instead of an open communication of results by a variety of researchers, we get a much smaller number articles using a small set of technique, usually those which are least controversial, by a small number of researchers.

positional good. It has gotten to the point where, in addition to my reservations about peer review and publication delay, I feel—as someone with a secure and very comfortable job—a little guilty even submitting to those journals (and generally don't except with graduate student co-authors).

As a consequence, our supposedly "flagship" venues have become little more than a disciplinary Romper Room.[65] And except for the occasional useful bit of research that accidentally finds its way past peer review—and those usually the product of the productive final years of graduate school—the individuals pursuing these publications are almost certainly in the *least* creative phase of their careers, unmoored from the supportive environment of grad school, beset by a strange new job, institution, class preparation and the hazing exercises inflicted upon the assistant professorate, and will find their creative research persona [if ever] only after tenure.

This is not to say that *everything* in the flagship journals is crap; merely that an increasing amount is crap. We see this in the steady decline of the impact ratings of the *American Political Science Review* and *American Journal of Political Science*: when *Political Analysis* first surpassed these to become the top journal in the field according to impact factor, it was considered a fluke. But that trend continued. *Political Analysis*, of course, has the advantage that it will never become one of the "sacred journals": too much math. Consequently, while everyone wants to *publish* in *APSR* and *AJPS*, they actually *read Political Analysis*. What a novel idea.

Second, editors have reduced the review time in reaction to the days when individuals were known to send a birthday card to their article when it spent more than a year in the review process, and in a [failing] effort to shave at least a little time off the long publication delays noted above. But this has led to a commons problem, since with shortened review times, there are no disincentives to simply working an article "down the food chain," leading to greater demands on reviewers.[66] Which wipes out any reduction of the delay time, which in many cases is getting worse.

Finally, we have the effects of long-distance technical collaboration.There is an old saying in the building trades that "Two men can do the work of three, three men can do the work of four...". In contemporary co-authored quantitative research, the sequence isn't $n_i = n_{i-1} + 1$

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[65]Boomer cultural reference: just Google it.

[66]The absolutely worst offenders are those who tell graduate students to submit routine and immature seminar papers "just for the experience and the feedback." A five-year submission ban on anyone guilty of this behavior seems about right.

I have, on multiple occasions, received *exactly* the same article—not a word changed—from a lower ranked journal having negatively reviewed it earlier for a higher ranked journal: this story is common. On one occasion the author was apparently quite offended by what seemed to me to be the obvious response: simply sending the same review again. Go figure.

but geometric: two can do the work of four, three can do the work of nine.... The reason—thank you, Adam Smith and the [in]famous pin makers—is specialization and the division of labor.

Suppose I have a clever and new (or, more typically, an not-all-that-clever and incremental) hypothesis. However, in order to test it, I need to master a new literature, a new data set, and new statistical method. To do so, I'm probably looking at a couple of weeks if not months of work. But if I put together a collaboration with someone who already knows the literature (and has a ready set of `BibTeX` citations), someone who already knows the data (and has the R scripts to manipulate it), and someone who already knows the method (and has the LaTeXequations as well as the R scripts ready to go), the labor requirements are reduced dramatically. And with collaboration mediated by the web, those collaborators can be from anywhere in the world.[67] Collaboration makes things very easy now, which is probably good for the science, but has ill effects on the horse-and-buggy era journal model.

Exponential growth generally has one of two outcomes. First, the system will hit an inflection point as it reaches a point halfway to the carrying capacity[68], or it will overshoot the carrying capacity and crash (think "tulip, real estate and stock market bubbles"). My sense is that we are closer to seeing the second outcome than the first because of the availability of attractive alternatives.

8.2 Proprietary Journals

As we have all learned from the Silicon Valley entrepeneurs who become billionaires before the age of thirty due to a brilliant new idea, every new enterprise needs the short and

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[67]I once introduced two researchers, who subsequently went on to get an NSF grant for their project, and published multiple articles in the sacred journals. About three years later I suggested we get together at ISA, and this was only the second time they had been physically in the same place, and in fact weren't sure they recognized each other. Of course, now Skype solves that problem.

[68]The relevant equation is $\frac{dx}{dt} = rx[1 - \frac{x}{K}]$ for those who care about such things.

pithy "elevator speech." Try this one:

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I've identified a large group of generally intelligent and very hard-
working people.  I will ask them give me, without compensation, the
rights to the works they've created.  I will then sell this back to
them at an ever-increasing price which will have no relationship whatsoever
to my costs.  And because these people, more than anything, want their
work to be used by others, I will lock it down, in perpetuity, and charge
everyone else to access it!  I will even solicit rational choice articles
for this project!
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Any sober individual hearing this pitch would immediately conclude either that they were dealing with a lunatic, or look around for the hidden camera, assured they were the unwitting participant in an absurd comedy sketch.

I have, of course, simply presented the business model of the proprietary academic journal. You got a problem with it?

This model, needless to say, is doomed. It is an anarchronomism, the flashing swords of the Polish horse cavalry confronting the German panzers at Krojanty in 1939;[69] Wiley Coyote, ten feet off the end of the cliff, suspended in mid-air and about to look down. It won't last, except to the extent that it does.

The problem is further complicated by the issue of open access. In the Baconian model, science was to be a public good. And in comparison with the secretive guild-based knowledge of the pre-modern period, Bacon succeeded. But, inevitably, there are evil-doers that will seek to privatize public goods: Acemoglu and Robinson [2012] provide, oh, maybe a couple thousand examples. Nothing unique about academic publishing in this regard and the individuals and institutions trying to accomplish this are not necessarily evil . . . no, wait, scratch that, they are evil.[70]

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[69]okay, okay, that's a myth—they first successfully charged German infantry, and some armored personnel carriers arrived later, and the results were stage-managed [by paleo-postmodernists] for Nazi propaganda. "This is the West, sir. When the legend becomes fact, print the legend." Publisher Maxwell Scott in *The Man Who Shot Liberty Valance* [1962].

[70]I do not use this word lightly. My late wife, Deborah Gerner, had produced a moderately well-selling history of the Israeli-Palestinian conflict, *One Land, Two Peoples.* It was more sympathetic to the Palestinian side than most of the available treatments, and found a comfortable niche in that small market. The company who had originally published it—and, of course, had locked down 100% of the IP rights, per non-negotiable contracts—went through a series of acquisitions, and those rights individually ended up in the vengeful maw of a publisher who was, shall we say, not particularly fond of this approach, and demanded a wide range of politically-motivated changes. Gerner did not want to do these, so the publisher kept the book "in print" in what looked like a fifth generation photocopy, to prevent rights from reverting.

By the early 2000s, Gerner was dying of metastatic cancer. She had only a limited number of projects she coiuld complete, and one that she very much wanted to do was an update of *OLTP*. A friend of Gerner's who

Exactly *whose* intellectual property is being stolen here is a bit unclear, as the research which ends up in journals is variously funded by educational institutions, government agencies such as the NSF and NIH, in the medical field, large private foundations, and simply by additional work of the individual researcher. Nowhere on this list, however, do we find the publishers, and furthermore, most of the sources funding the research are not-for-profit and interested in advancing public goods. Not merely in sustaining the 36% profit margins that the decidedly private and for-private Elsevier has maintained since 1998.[71]

On the positive side, political science doesn't seem that bad off compared to many of the natural sciences. There aren't too many journals covering the field, though recent trends in journal proliferation in the International Studies Association *might* be worrisome.[72] There seems to be a consensus on the relative ranking journals that is not wildly off base from the impact factors. The field has not massively split into subdisciplines that won't talk to each other (contrast sociology and comparative literature), though the Perstroikans are working on this. We don't have page charges, and appear to be below the radar of the more rapacious of the commercial publishers. And we have had some gracious benefactors such as Sage Publications—until recently[73]—and Sarah Miller McCune in the area of journals and Lynne Rienner of the eponymous book publishing house in the field international relations and comparative politics. Some of this may be due to the different structure of the social sciences, where after getting tenure, most people drop out of research, whereas in the natural sciences they not only continue to work but have large laboratories churning out a constant stream of articles.

The greed of the journal publishers is, apparently, boundless. Sage Publications, 23 April 2012, wanted $25 for 24-hour access to a PDF of 3-page article in *Conflict Management and Peace Science.* By way of comparison, for a total of only $23, I had recently purchased on the Amazon Kindle site—for indefinite use—both Fukuyama's 620-page *Origins of Political Order* and Acemoglu and Robinson's 546-page *Why Nations Fail.*

The publishers, of course, claim added value. But how much value is actually added by the publisher? Let's assume that a productive researcher in international relations will produce the equivalent of three single authored articles per year.[74] Someone at a research

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was one of the most respected publishers in the field of comparative politics attempted to buy—at whatever price, and after explaining the situation—the rights to the book so that Gerner could write a new edition. This offer was refused. Gleeful exercise of corporate power trumped the request of a dying woman. Gerner was never able to do the revisions.

Remember this the next time a publisher asks you to sign a contract.

[71]http://www.guardian.co.uk/commentisfree/2011/aug/29/academic-publishers-murdoch-socialist
[72]Or alternatively, realistic, as that same ISA has moved entirely to electronic publication.
[73]Now? "Blood-sucking vampire squid" maybe. Or is that too nice?
[74]That's my rule of thumb based on having looked at a huge number of vitae, albeit unsystematically. It may be quite different for other fields, and single-authored technical articles are very rare these days so the

university should be putting in 800-1000 hours per year on research, which works out to about 300 hours for an article. It is hard to imagine the production arms of the journals—as opposed to the additional free time donated by reviewers—contributing more than 3 hours in editing and compensated document management.[75]

So, should adding 1% of the value entitle you to 100% of the intellectual property? On what planet? And this before noting that this period of massive price inflation has occurred at the time when journals went from receiving typed articles to receiving all text, equations, and graphics in standardized electronic form, and—we hope—spell-checked. The labor requirements dropped precipitously; the price went up precipitously. Huh?

Finally, please note that while the worst offenders are clearly the major commercial publishers,[76] the rent-seeking bureaucracies[77] of the professional organizations have also been strongly resisting open access models. This is most conspicuous in the large medical and physical science societies, but parts of political science are not immune. Notably that part which has chosen to situate their headquarters between two embassies in some of the most expensive real estate on the planet, when comparable organizations do a perfectly satisifactory job running from the substantially less expensive Bloomington, Indiana and Tucson, Arizona. I vividly recall[78] discussing open access—a very hot topic at Kansas, which under then-provost David Shulenberger was a leader on this issue—with the executive director of the APSA, and from his reaction you would have thought I'd suggested we could increase the revenue by advertising child porn. Possible benefit to the members?—not even a consideration. One of several reasons I left the APSA.

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number may be higher or lower.

[75] And this is taking into account only the time of the individual researcher. If the project involves surveys, GRAs, and/or expensive data collection efforts, the added contribution drops even further, though those efforts are usually also amortized over multiple articles.

[76] http://thecostofknowledge.com/

[77] This is a technical, if very useful, term in economics and political science: "In economics, rent-seeking is an attempt to obtain economic rent by manipulating the social or political environment in which economic activities occur, rather than by creating new wealth, for example, spending money on political lobbying in order to be given a share of wealth that has already been created. A famous example of rent-seeking is the limiting of access to lucrative occupations, as by medieval guilds or modern state certifications and licensures." [Wikipedia, 2 May 2012]. See Acemoglu and Robinson [2012] for a rather depressing assessment of the implication of the practice at the national level.

[78] Berkeley workshop on measuring governance, 30 October 2008, first coffee break in the morning.

8.3 Peer review

Peer review?—can't live with it, can't live without it. On the one hand, it is one of the defining features of the modern scientific enterprise, and in the pre-Web, the alternative—selection via old boy networks[79] to the exclusion of anyone not part of a hereditary elite[80] —is certainly far worse. Much as Winston Churchill characterized democracy, it is the worst of government except all the others that have been tried.[81]

I recently received, in quick succession, an editorial decision on a paper—described by a reasonably well-qualified discussant at MPSA as one of the most interesting things he had ever seen—rejecting it with essentially no review at the one of the "Top Five" IR journals[82] followed almost immediately by an editorial decision on a paper I had described in my review as one of the most interesting things *I'd* ever seen (a social network analysis of ICEWS data by Mike Ward and some collaborators), said review twisted by the *APSR* collective *nomenklatura* to justify *rejecting* it, precisely the opposite of my intent.[83]

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[79]And yes, they were almost exclusively boys, and no small number were old.

[80]In international relations, the Neanderthal unrefereed *World Politics*, thankfully almost the very last of a too-slowly dying breed supported by trust funds, a social network of polo clubs and prep schools, and the 15% tax on capital gains.

[81]Though this should be kept in the context of at least two other alleged Churchill quotes, "The best argument against democracy is a five minute conversation with the average voter." and "You can always count on Americans to do the right thing. . . after they've tried everything else."
http://thinkexist.com/quotation/it_has_been_said_that_democracy_is_the_worst_form/15815.html.

[82]Admittedly, a bit of a sick puppy at the time due to a difficult transition from a long-serving editor.

[83]And yes, partly because it had too much math: they said so. Though it could be worse: see http://chronicle.com/blogs/percolator/wait-maybe-you-cant-feel-the-future/27984 for the tale of three psychologists who could not get a refutation of an article claiming to prove the existence of extra-sensory perception published because one of the reviewers said that their thoughts could have influenced the experiment. And the editor agreed.

I summarized this experience, to my long-suffering department head, as follows:

> Thank you for your recent submission to our prestigious journal. Your article has been casually reviewed by two embittered assistant professors (both noting that you failed to cite their recent regional conference papers) and a grad student (who we have reasons to believe understood both the lit review and page numbers), and in the opinion of the editorial board, which has looked at forty-two such reports today, if you will please remove all of the interesting results, eliminate the math (sorry, but the thoroughly-modern political scientist DOES NOT LIKE MATH!!! and in case you haven't noticed, you pathetic loser, the Perestroikans now control political science), and go through at least three more revise-and-resubmits, there is at least a possibility we will publish what's left of your article in two or three years. We look forward to your response.

I should make it clear that I do not think the peer review process is uniformly bad—actually, most reviews I've seen[84] are reasonably responsible—but the burden on the *editors* appears to have reached a breaking point. Which has in a number of important instances resulted in the infamous rule that any negative review, however misguided and unqualified (or misinterpreted) leads to rejection. Everyone has their horror stories : One of the first articles I submitted as an assistant professor received a two-line review—in crayon[85]—saying it should be rejected on the basis of—you guessed it—too much math. But it was eventually published in *AJPS*, thanks to a kindly editor whose name rhymes with "Phil Shively." Everyone in the business has similar stories, and those we can live with.

My argument, instead, is that this system is now under unprecedented stress, as indicated in Section 8.1, which is producing a higher levels of pathology, and meanwhile there are alternatives which will likely perform at least as well.

For starters,we know, based on long-term citation patterns, that most of the end products of this system have only limited impact. The situation is not as bad as the widely cited figure—based on Hamilton [1991]—that over 90% of political science articles have zero citations, but a recent analysis Samuels [2011] shows that about 70% of articles have fewer than 6 citations as measured by the *Social Science Citation Index*, and fewer than 11 citations as measured by a combination of *SSCI* and Google Scholar. Given that this almost certainly includes a substantial number of self-citations, and Google Scholar, at least in my experience, can do some odd double-counting, these figures are optimistic. This is not a particularly good yield given the efforts involved.

With a few exceptions [Schrodt, 1990] the peer review process keeps junk out of the journals. But does so at the cost of biasing the system to publishing safe, predictable,

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[84]I see a lot, given that many journals now circulate all of the reviews to the reviewers, a simple method of increasing quality control.

[85]okay, it wasn't really in crayon...just seemed like it.

incremental, lowest-common-denominator articles.[86] This has been a long-term complaint, and, for example a remarkable number of works that went on to win Nobel Prizes in various fields—but particularly economics [Gans, 2001, Gans and Shepherd, 1994]—were initially rejected in peer review. Yes, yes, lots of crap that shouldn't be published at all got eliminated in the process but in a Web-enabled world, there are other ways of dealing with this.

Second, peer review is a remarkably time consuming for all concerned—authors, reviewers, editors, and editorial staff—in order to produce a product that, much like the consumer products factories of Soviet-era Eastern Europe, are actually *subtracting* value: The product coming out is less valuable than the materials going in. To say nothing of thoroughly out of date by the time it is published—the "revise and resubmit" process is devastating in this regard for any topic with an active research community. Which is to say, any topic where you need journals in the first place.

Stated another way, peer review—in addition to correcting errors, but I think it does a very poor job, or at least extracts an unacceptably high price—substitutes the brand of the journal for the brand of the author. This is quite rational until one uses a one-size-fits-all where the imprimitur of the author alone should be sufficient, and peer review becomes value-subtracting.

The solution here from the perspective of the dissemination of knowledge is both simple, nearly costless, and inevitable: the Web self-organizes, and it does so with a minimum of delay. Work that actually advances science will be noticed, and cited, and this will occur without multi-year publication delays and revisions which eviscerate the original work. The work that is largely useless, or just plain wrong, will disappear, or if it doesn't disappear, serve to remind the community that the author is an idiot.

An example? Invoking the anthropic principle, I can be assured, gentle reader, that you are reading these words because you became aware of this manuscript through some mechanism outside of the peer review system. And I would hazard that this is not the only thing you are reading because of such mechanisms, and it is quite likely that you can reading an increasing amount of material in these manners. The question is then whether we can augment and make more efficient those mechanisms which are already being used. As I note below, there is still a need to appease the needs of the hiring and tenure bureaucracies, but that is a separate issue more or less unrelated to the dissemination of knowledge.

At an institutionalized level, the *Public Library of Science-One* (`http://www.plosone.org/`) provides a fully-implemented model for an open-access, peer-reviewed Web "journal" which

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[86]In political science and economics. Psychology, curiously, apparently has the opposite problem, with articles claiming unexpected—and quite possibly, spurious—results are more likely to be published [Carpenter, 2012].

has proven highly successful—both in the quantity and impact factor—in medicine and biology. From the perspective of the social sciences, however, the clear downside of the *PLOS-One* model is cost: $1350 per submission. This is not out of line for the natural sciences, where publication costs are typically a relatively minor cost compared to the investment in the massive labs and equipment required to do the research in the first place, and are also a long-established practice, but would be prohibitive for most social science researchers.

But if *PLOS-One* has provided the model—that's the hard part—couldn't some consortium of institutions provide something comparable for the social sciences? Hardware isn't the issue: *Social Science Research Network*, the closest thing we have, currently hosts about 350,000 papers. Figure these average 10,000 words each, and then multiply by a factor of 20 to handle every possible source of underestimating you can think of, and that still comes in under 500 Gb. Which currently retails for about $70.[87] The issue is support and administration, and a credible commitment to this, but would that truly be more expensive that the extortionate fees universities are currently paying for journals? Think about it.

8.4 The Future of the Journal

I suspect that the broad solutions to these issues are, for the most part, inevitable, and will look something like the following. (and these suggestions are by no means original and are currently under wide discussion, as well as early implementations.)

- At present I see no substitute for the rigorously peer-reviewed Romper Room—a.k.a. "flagship"—journals in the tenure process. They are that rite-of-passage, deeply steeped in all human cultures, the transition to adulthood, and like all such quests, typically take a lot of time, are intensely painful, and not infrequently involve the consumption of positively reckless levels of psychoactive drugs. But let's recognize that this has become the dominant role those journals accomplish and expect little more. And let

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[87]Or you can put almost the entire archive on a 16 Gb thumb drive which your cat [could | will] swallow.

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us limit the quantity—and thus the unsupportable load on editors and reviewers—by applying the NSF rule: tenure is evaluated only what you designate as your best N articles (N=10 for NSF).[88]

- Purveyors of dead trees are doomed, and open-access will in all likelihood triumph, albeit possibly at a cost in the quality of the writing. Generally, editing is a good thing—you've undoubtedly noticed its absence here.[89] However, one could argue that if something has a 70% chance of being cited fewer than six times, we can afford to let the quality of the prose slip here and there. We're not talking the Revised Standard Edition of the Bible here.

- We need to find an less-easily-gameable—that is, costly and trackable—reputational method for evaluating the quality of post-tenure materials. Networks of citations may work just fine, and are readily available in generally convergent forms.

- The journal as journal is probably going the way of *Encyclopedia Britannica*, and the rent-seeking bureaucracies they support will go the way of the *Britannica* door-to-door sales force. The self-organizing web will rule.

- The article as the *unit* of research, on the other hand, will probably continue (as will variants such as the monograph and the book): it has evolved into the current, easily digestible form for a reason. Though the political science form of the fixed 30 ± 5 pages is not immutable, and the next generation article will be massively embedded, with links both inward and outward, in the Web.

- Academic institutions—or what is left of them—need to redeem their place from the proprietary parasites as the repositories of this knowledge, or else relegate this to specialized institutions. The commercial model has failed—the temptations for rent-seeking are too great, and it is time to tell not only the publishers, but the professional organizations who have grown fat at the expense of university library systems that sorry, we let you play with our toys and you broke them, so you are not going to be invited back.

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[88]Effectively, this was the situation in the old days (ca. 20 - 30 years ago) when the norm in the social sciences was "1 book for tenure, 1 book for promotion to full" (usually with a small number of minor publications on the side). Academic books being of [decidedly] finite and more or less fixed length, you maximized your investment of effort on those limited opportunities to demonstrate your skill as a scholar.

[89]In the long run, advances in natural language processing software may allow automated correction of many issues currently addressed by human editors, much as spell-checking has already done. Though we aren't there yet.

All of this is likely to occur pretty much without us doing anything, and thus this is a forecast, not a manifesto. And that's not a threat, it's a promise. Change is coming, and if you're not at the table, you'll be on the menu.

Now, on the more speculative side, there is at least one [hypothetical] way to force a shift away from the existing system and into the legitimation of the open-access server model: employ the "John Galt gambit."[90] A suitably conspicuous group of scholars who do a great deal of reviewing—let's say in political science, start with the Fellows of the Society for Political Methodology—collectively declare that they will no longer:

- submit articles to refereed journals

- review for refereed journals (while committing to review for an open access server)

- evaluate material that is part of a tenure file unless it has also been submitted to an open-access server.[91]

This presupposes, however, that a credible open access server exists. We don't have that at this point, and the technical impediments to creating it are...[crickets...]. Institutional impediments are more substantial.

A final caveat. Critically, I am aware that like so much of this manuscript, this is the screed of a geezer. *I* don't need no stinking peer review, nor even stinking journals.[92] I'm my own brand, but I've been around for a while. And I hold, at least at the moment, one of those ever-decreasing tenured lines. A younger scholar, and a dean/department chair/tenure committee evaluating a younger person, still does, at least sort of. Which doesn't mean that the system isn't broken, but it is still needed.

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[90]Not to endorse Ayn Rand—who, in strictly clinical terms, is "a friggin' loon"—but as they say, even a blind pig finds an acorn now and then.

[91]This would not preclude the individuals from also submitting to refereed journals, as *generally* these allow the posting of pre-prints on servers. And those which do not should be driven into oblivion. The requirement would simply be that the research also would need to be available on the open-access site.

[92]And by the way, get off my lawn!

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