

13 Understanding the Research World

I want to assume now that you have built a network, internalized most of the lessons that I have outlined above, and generally gotten yourself established in your field, and that you now want to understand the dynamics of the research world in a deeper way. Everybody that you work with has been building their own network in more or less the same way that you have been, and the institutions of research create tremendous incentives for everyone to keep on doing so. Beyond that, however, the institutions create new incentives for people who have reached the plateau that you have -- providing yourself with a functioning network -- and who want to move on to higher levels of accomplishment in their field. To understand these higher-level career strategies and their implications, another round of basic concepts will be required. This section lays out these concepts seriatim, and the next section agonizes over their moral consequences.

I should warn you that some of these concepts concern the more dysfunctional aspects of research institutions. My purpose in explaining these concepts is not to demoralize you, but quite the contrary to help you notice them, avoid them, if necessary defend or even cure yourself from them, and ultimately adopt a bemused distance from them as you go about the daily work of positive community-building.

(1) The invisible college

When most people look at the university, they see a physical campus with buildings and people. Even if they went to college themselves, they probably have little understanding of the institutions of research. Accordingly, as you are socialized into those institutions yourself, you will probably acquire a different awareness of them. You will develop a professional network that includes researchers at several universities, and you will learn about the people and activities at those other universities. As a result, you will acquire a mental map of numerous universities and their associated orientations, reputations, and histories. This map will be very real to you, and you may know more about your counterparts in a university on another continent than you know about the people in the building next door to you. The interconnected global research network is largely invisible to outsiders, and for that reason it is called the "invisible college", a term that derives from

Diana Crane's book "Invisible Colleges: Diffusion of Knowledge in Scientific Communities" (University of Chicago Press, 1972).

The concept of an invisible college is useful for several reasons. First of all, it helps to explain some of the institutional tensions that universities face: individual researchers generally identify more strongly with their invisible college than they do with the organization that employs them. After all, it is principally the invisible college that evaluates the researcher's work by writing letters and refereeing articles. Universities are always threatening to be pulled apart by these centrifugal forces. Industrial labs, likewise, often have trouble persuading researchers to focus on the issues that affect customers, because the researcher's long-term career success depends on staying current with research agendas in the invisible college.

Invisible colleges also help explain the emerging uses of technology in research. "Collaboratories", for example, are on-line research community environments that cause invisible colleges to become, so to speak, more real. Most invisible colleges already have conferences, journals, and the like. They may even have Web sites and mailing lists. In each case the pressure is toward ever-greater integration of the different research groups within an invisible college. As the collaboratories become more technically feasible, these pressures will become even more intense. Ongoing real-time collaborations between researchers at different sites will become more common, and seminars might even be held at several sites simultaneously over video links. The details will depend on the needs and finances of each field, of course, but the general direction of the pressure toward integration will be largely the same. It is worth wondering, then, whether too much integration can be a bad thing. It is useful for each university to have its own distinctive approach to a field. Diversity is good, and the institution only supports diversity if a new approaches can colonize a small number of universities without excessive pressures to be interlocked with their opposite numbers at other universities. This may be an important issue in the future.

Finally, the concept of an invisible college helps keep you human. You can become so immersed in your own particular invisible college that you become oblivious to your environment -- the neighborhood where you work. Think, for example, about the other universities in your region. Are they on your map at all? Do you feel bad about that?

(2) Networked individualism

Let us take the concept of an invisible college a step further. Imagine a vast diagram of all the professional networks in the world of research. In this diagram, everyone will be connected to everyone they know. Abstract as it sounds, such a diagram can actually be drawn with reasonably accuracy by following the citations in their published work. The analysis of these citation links is called "bibliometrics", and is a scholarly industry in itself. Throughout this article, I have been painting a picture of the structure of these relationships. When two researchers have become members of one another's professional networks, they maintain a sort of surveillance of one another. They read one another's published work, monitor one another's career progress, hear reports on one another through common acquaintances, update one another in periodic conversations at conferences, and so on. Their relationship has an architecture -- a structure and logic that are dictated largely by the workings of research as an institution.

On one level, the architecture of relationships in the research world has not changed much since the Renaissance. Scholars have always read each other's work, corresponded, traveled to visit one another, cooperated and competed, and so on. So what changes in the world of the Internet, not to mention cellular telephones, cheap air travel, and other technological advances? Those new technologies do not change anything on their own, but they do provide tools that people use to do more of the things that they already want to do. The institutions of research create tremendous incentives to keep in touch with the other members of your professional network, and that's what's happened: people are in much denser and more continuous contact with their professional contacts than ever before. It is only a slight exaggeration to say that we're heading toward a world in which everyone is a constant presence for everyone else. Technologies that are currently under development will propel this trend even further. Digital libraries, for example, will allow everyone to monitor everyone else's publications in real time, and cheap, high-quality video links will make it possible to organize seminars at a distance. While they will not eliminate face-to-face interaction altogether, these technologies will allow researchers to maintain even more continual contact than they do today.

This development is striking, and it counts as a new chapter in the history of the human person. Barry Wellman calls it "networked individualism". Networked individuals (such as yourself) are like air traffic controllers who, by using a video display and

audio communications, constantly maintain a mental map of all the planes in their airspace. This effect can be quite tangible when you are reading your daily e-mail, and it can be especially tangible when you are working on a large-scale professional project, like organizing a conference, that requires you to keep track of the status of dozens or hundreds of individuals, or to reach out selectively into the space of individuals in your field to identify the best speakers, authors, referees, or meeting participants for a given purpose. As the world becomes networked, you will have to decide consciously how to manage the blizzard of communications that your network will entail.

(3) The expanding universe

So far I've been making it sound as though all networks are equally good. Start with what you care about, get some research going, and build a professional community for yourself around that research topic. And that is still my advice. Nonetheless, the problem of building a network takes on another dimension when you adopt a longer-term view. If you are entering the research community at the usual age, just out of college or a few years afterward, then you have a whole career ahead of you. To really prosper, and to really be part of something exciting, you want to join a field that is growing -- what I call an "expanding universe". A field that is shrinking is generally an unhappy place to be; at best it spends its time negotiating mergers and acquisitions with other shrinking fields, hoping to maintain the critical mass that is necessary to be a viable political force. People find themselves fighting over fewer resources, and they have a much harder time attracting new blood. A growing field, by contrast, easily attracts new people. And resources are multiplying, so people don't need to fight one another. Instead they can join together in the collective enterprise of laying claim to the new territory that is opening up.

Smart students have a powerful instinct for expanding universes, and often spot them before the famous people do. How the smart students work this trick is one of the deeper mysteries of the professional world: after all, they are just students, and thus lack the extensive networks that are normally required to see big patterns. Part of the answer is simply that they are young. The way that ideas change is that the people who believed the old ideas die (Planck said this), and in this sense intellectual trends are driven by the interests of the young. This is one reason why it is okay for you to pursue the research that you personally find exciting: despite all of your unique individuality, you are also a product of a place and time, and even before you start networking you can be confident that

plenty of other people will develop research interests that are more or less on the same wavelength as yours. You will network with those people, and when the old people die you and your cohort will inherit the world. At the same time, you can frame your topic in a lot of different ways, and it's helpful to frame your topic in a way that other people can relate to. That is part of what I mean by "articulating an emerging theme". In trying to articulate the theme that unifies the research of your peers, and that puts a name on what they find exciting about their research, you will be intuiting -- indeed, creating -- the expanding universe of your generation of researchers.

(4) Positive feedback

You are probably familiar with the general idea. Negative feedback is when forces operate to keep a system in equilibrium, pushing it back toward its nominal value whenever it drifts away. Positive feedback, by contrast, amplifies small disturbances so that they feed upon themselves and become ever greater. Complex real-world situations generally combine kinds of feedback, but it is useful to consider some of the positive feedbacks that promote successful careers. Let us say that you happen to mention topic X in a speech, and a reporter calls you to comment on it. You may not be an absolute authority on X, but if you are the first person to be quoted on X then you need to start studying. Why? Because reporters often decide who to call for quotes by looking in Nexis and seeing who has been quoted in earlier articles. Having been the first to be quoted, you will also be the second, third, and fourth. Soon you will be closely identified with the issue, nobody else will have a chance. The same thing can happen in many other contexts, including speaking engagements, consulting jobs, referrals, and (to a lesser degree) citations. (Of course, once your position has become entrenched in this way, it's not positive feedback any more. It's negative, as institutional forces operate to reinforce the status quo in your favor.)

Another type of positive feedback is learning: if you learn about an activity (such as a certain experimental procedure), then you are more likely to get further chances to engage in the activity, thereby learning some more. Yet another type is networking: if everyone knows that you have a big professional network, then they are more likely to want to meet you, thus increasing the extent of your network. People often stumble into careers because these types of positive feedback get started by accident, and good career strategies always encourage positive feedback. Pick an emerging issue and stake it out as your own: become publicly identified with it, learn the details of

it from practical experience, and build professional networks around it. If you pick a good issue then the universe around it will expand, and your career will expand along with it. Picking an emerging issue is like placing a bet; your own intellectual intuition is the best guide to the best issue, but internalizing the views of others through networking is a good way to deepen your intuition.

Positive feedback also applies to departments, universities, and industrial labs. People want to work with the best people in their field, and so whichever organization first gets a critical mass of strong people can hire the best, thus locking in its position over the long term. This fact explains a critical fact about the hiring strategies of deans. As a general matter, it is in the dean's interest to build specific areas of strength that correspond to expanding disciplinary universes. That is, the dean's job is to build a group of researchers in a field whose prominence and resource base is likely to grow in the coming years. Choosing a research area that represents an expanding universe is obviously a good strategy, because an investment in that area will pay off as the field becomes more prominent. But it is a good strategy for another reason, which is that existing, already-established research areas have already become dominated by other organizations. Those organizations benefit from positive feedback, and so it is little use to compete with them. Instead, the dean seeks to get positive feedback working from scratch in a new area.

(5) Arbitrage

Arbitrage is a concept from finance. An arbitrageur monitors two or more markets, looking for gaps in prices. If apples are selling for \$1 uptown and \$2 downtown, the arbitrageur will swoop in, buy some apples uptown, and sell them downtown. The resulting profit will depend on communication and transportation technologies, and the magnitude of the price gaps that open up in practice will be limited by the number of competing arbitrageurs. Fully arbitrated markets have uniform prices. To remain profitable, therefore, an arbitrageur must innovate technologically or search for markets that are not yet well arbitrated.

Something similar happens in the research world. A researcher might notice that a concept that is well-developed in one field can be applied to problems of wide interest in another field. If the concept is still unknown in that other field, then an arbitrage opportunity exists. This is how management consultants work: they work with one company, learning that company's organizational and

technological skills, and then they sell their enhanced skills to other companies. (See Geof Bowker, *Science on the Run: Information Management and Industrial Geophysics at Schlumberger, 1920-1940*, MIT Press, 1994.) It is also the way that many careers are made in research: either by shifting a steady stream of concepts from field A to field B, or by taking a particular concept from field A and looking for many different fields where it can be applied, or by moving from one field to another, picking up concepts in each and then looking for another field where they can be applied. These are entirely honorable ways to make a living, and they provide the intellectual cross-fertilization that keeps fields healthy.

The position of the arbitrageur can be understood in terms of social networks. In some cases an arbitrageur can learn new concepts, or contribute to new fields, simply by reading books. More commonly, however, the arbitrageur builds a network in each field, consisting of those researchers whose work is relevant to the arbitrageur's own interests in that particular field. Of course, the very idea that the arbitrageur builds two different networks is somewhat artificial: the whole research world is one single network that is more highly connected in some regions than in others. "Fields" can be identified by their ideas and methods, but they also correspond to regions of high interconnectivity in the sprawling network of the whole research world. Arbitrageurs are effectively taking advantage of regions where the networks are relatively thin, importing and exporting useful goods (ideas, concepts, methods, tools) based on a strong understanding of supply on one side and demand on the other.

The opportunities for arbitrage are one reason why I have encouraged you to ignore disciplinary boundaries as you build your professional network. By looking for professional friends who are related to your research interests in several different ways, I suggested, you would create a network that looks like spokes in a wheel, of which you are the hub. If some of these people have nothing in common with one another then that's a good thing. It means that you will be able to establish a "trading zone" through which good ideas can transfer between fields that are not otherwise connected. By spanning several research communities, you will have more intellectual resources and career options than if you simply tried to join an existing group.

(6) Disciplinary narratives

As a scholar, you are certainly aware of your responsibility to cite relevant work by other people,

especially when your own work builds on it. Your papers, like most people's, probably contain sections that are largely devoted to citing past work, and you probably distribute citations through the rest of your paper as well. This is good; it is part of the process of knitting yourself and your work into the web of relationships in your community. But you can also look at these citations another way: as a narrative of the history of the field. These narratives may not be great literature, but they are narratives nonetheless. They have characters, events, and a chronological story line. They recount the creation myths of the field, its conflicts, its heroes and villains, and so on. The narratives in your paper will be shaped by your reading and relationships, but they will also be influenced by the narratives that you have heard or read from others. It is fairly unusual, for example, for a scholar to come along and tell the history of a field in completely different terms, recognizing different founders or different heroes, or giving a central place to different innovations and departures than the ones that normally form the backbone of the field's narratives of itself.

Where do these narratives come from? At one level, everyone fashions their own narrative, connecting the dots among the various prominent works that relate to their own. Having laboriously rehearsed their personal narrative in their dissertations, they keep it up to date as their own work evolves, and as new work appears. At another level, however, the narratives are constructed collectively. People who do related work will probably have related narratives, and people who work in the same field will probably derive much of the outline of their narrative from whoever founded it. When someone founds a field, they are usually very concerned to give the field a proper history. This might involve identifying precursors, marking out the differences between the new field and older fields, making clear which work the new field defines itself against, and so on. Later on, other people in the field will be sure to cite the people who have most influenced them. Peer pressure will grow to cite particular works that are thought especially important.

Over time, a more or less conventional narrative will take form. This conventional narrative is not a simple thing. It may settle disputes over who should get credit for a given innovation. It may embody a collective judgement that certain works represented side branches or cul-de-sacs, and that certain other works represented the main line of development. Ideas from certain works will become part of the routinized story that people tell about their field, and the works will be heavily cited accordingly. Or a work may introduce an idea that seems revolutionary at first but then starts to seem so obvious that people forget that it needs to be

cited any more. Some authors may make a special point of insisting that their work be cited, where other authors may not care as much, or may not be around to check up. In short, the conventional narrative emerges as a sort of collective negotiation among the field's members. And as new scholars encounter the conventional narrative in their readings and lectures, it settles into place and becomes practically irreversible.

I mention these disciplinary narratives for several reasons. First of all, I don't want you to be imprisoned by them. Look at them **as** narratives, as stories that are told according to certain conventions, and that could have been told differently. See their political character -- not necessarily as a sign of bad faith, simply as a sign of their having been created by human beings through their dealings with one another. As you read the literature, consider whether the conventional narrative of your discipline should be rewritten. Declare independence by quietly citing works that have been unjustly neglected by others (such as works by people who haven't done their networking). Ask yourself if the field's founder constructed a creation myth that exaggerates its differences from what came before, or that emphasized a single moment of invention when in fact (as often happens) the basic ideas emerged in several places more or less at once. Maybe you want to rewrite the narrative a little bit in your next paper. And think about how your own work deserves to fit into the narrative. Describe your work accordingly in your papers, and do make sure that the people who should be citing you feel a bit of peer pressure. You don't have to be a jerk about it, but you don't have to get trampled either.

There is an aspect of disciplinary narratives that I want to emphasize in particular. When your field was originally founded, the founders probably overcame opposition from an existing establishment. As a result, the rhetoric that they developed and taught to their students was probably preoccupied with that particular fight. For example, artificial intelligence (in which I was trained, and whose story I will tell in more detail in a moment) began as a counterrevolution against behaviorism in psychology. Because of this the rhetoric of AI is saturated with turns of phrase that are designed to do two things: (1) set up a cleanly defined opposition between AI and behaviorism, and (2) portray AI as right and behaviorism as wrong. The AI people won their fight with behaviorism, which hardly exists any more as an academic force. And yet the fight goes on. The rhetoric of the field is still aimed at defeating behaviorism, and this causes AI people to interpret nearly any criticism as a resurgence of behaviorism, even when it clearly is not. It also causes

dissidents within the field to reinvent behaviorism under one guise or another, simply because that is what's thinkable within the vocabulary of the field.

This is the sad irony: even though AI won its fight with behaviorism, it did so by making itself much more similar to behaviorism than it should have. The problem is not so much with goal (2), portraying AI as right and behaviorism as wrong, as with goal (1), setting up a cleanly defined opposition between AI and behaviorism. In order to set up this clean opposition, it was necessary for the AI founders to commit themselves to many of behaviorism's foundational assumptions, such as the idea that cognition takes the form of an input (stimulus) which causes something-or-other (a blank zone for the behaviorists, a cognitive process for the AI people), which then causes an output (response). This framework has not served AI especially well, for example because it distracts attention from the ways in which people and robots engage in complex activities that are embedded in complex environments. Yet this complaint is hard to express in the language of AI, whose organizing question is still, "is this behaviorism, and if not then what's the problem?". You can accomplish a great deal by spotting this sort of out-of-date controversy and deciding not to participate in it. Even in cases where the "enemy" establishment is still very much in force, you will accomplish much more by honestly digging into the strengths and weaknesses of the two polarized sides, looking for a synthesis rather than a fight, than you will by joining someone else's ancient struggle.

(7) Advisors' incentives to stifle creativity

The next concept that you need is not so fun. This is the incentive that thesis advisors have to stifle the creativity of their students. It's an insidious phenomenon, and it is not entirely the advisors' fault. Here is how it works. Your advisor will organize seminars, or otherwise recommend reading, and the reading lists that result will derive from the advisor's own voice -- from an intellectual map of the world that reflects the advisor's own effort to define a research program and situate it within an existing network of professional relationships. If you confine your reading to your thesis advisor's recommendations -- or, even worse, if you feel so overwhelmed with work that you accept your advisor's interpretations of those readings rather than engaging with them afresh yourself -- then your thinking will be organized and bounded by your advisor's thinking. You will talk the way your advisor talks, cite the same work, address the same audience, and so on. Of course, this needn't be a disaster. If you are smart, and if your advisor has chosen an expanding disciplinary universe, then you will write a good

dissertation within that universe. You will get a good job, and you will take your place in a hierarchy. When the people in your advisor's cohort finally retire, then you will be in charge. It is not such a bad life. But it is not the life that you were meant to live -- the life that you would create for yourself if you complemented your advisor's teaching with some autonomous learning of your own, driven by your own sense of intellectual excitement and your own intuition for the expanding universe that is taking form on completely different ground from your advisor's.

So is your advisor deliberately brainwashing you in order to build an empire of clones and acolytes? Perhaps. Some advisors do this consciously, I am sad to say. It's their way of proving to themselves (and, they think, to others) that they are a success. After all, they are evaluated on their "impact" in their fields, and one way to create the illusion of impact is to program your students so that they are forever citing your work. Perhaps they just want to make sure that they do not die forgotten. Or perhaps they simply get locked into a fixed idea about your thesis topic and try to "help" you graduate on time by keeping you narrowly focused on that topic. Of course they rationalize it in various ways. But with other advisors it happens inadvertently. Your advisor is not God, cannot read everything, and inevitably sees the world in particular ways. Your advisor lives in a world that seems very big, and if your field is expanding then you could perfectly well construct a world within that world that itself seems very big. The alternative is not to renounce your advisor, but simply to reach out and take a broader view.

(8) Turf

I spoke of a growing field as an "expanding universe", but what exactly does it mean to say that a field is growing? Of course, on one level a field grows when more people join it. But that doesn't explain much. Nor does it explain much to say that a field grows when more money becomes available to fund its research, though money is surely not a trivial matter. At a more fundamental level, the size of a field is determined by the turf that it has staked out. My choice of the word "turf" is a little misleading, in that actual literal turf -- geographic territory with grass on it -- exists in a fixed quantity, so that the phrase "turf war" connotes a bloody, petty, zero-sum game. But that's not what I mean here. In the research community, turf arises when an intellectual leader defines a research agenda -- that is, provides a rhetoric for articulating research topics, arguing their importance, and defending their legitimacy. Having been made researchable, those topics can now be

turned into refereed journal papers, and thus into grant proposals, promotions, and careers.

Here are some examples. When Herbert Simon and his cohorts founded artificial intelligence in the 1950s, they created turf. In fact they created a huge amount of turf, since the general formula of using computational structures in analyzing human mental life can be applied in thousands of ways. Just pick a phenomenon of human mental life (choosing, remembering, planning, improvising, etc), select or devise a computational structure that seems generally analogous to it, build a computer program, and talk about the program in ways that make it seem similar to what people do. Other examples of research programs that create turf include Richard Posner's revival in the 1970s of the economic analysis of law (pick a legal issue and apply the language of supply and demand to it) and Noam Chomsky's founding in the 1950s of the modern study of syntactic analysis by means of formal language theory.

What's really striking about the case of Chomsky is that his actual territory of research concerned some extremely narrow questions about the formal relationships between certain kinds of grammatical structures, for example when assertions ("John took a six-pack to the party") become questions ("What did John take to the party?"). Even though these questions are tiny footnotes in the big picture of linguistics, Chomsky nonetheless managed to found an enormous research enterprise, one which many linguists have been brought up to regard as nearly the whole of the field. Chomsky was successful in founding such a large research program for a simple reason: formal language theory provides the intellectual tools to manufacture researchable topics. Accordingly, every paper in Chomskyan linguistics -- including several subfields of linguistics that broke off from Chomsky's own projects while retaining nearly all of the intellectual foundations that Chomsky created -- is written according to a sort of grammar that Chomsky defined and institutionalized.

These examples point to the actual nature of turf. In order to do research, and in order to publish your research, you need a research topic. Turf is, in part, a method of manufacturing research topics, a formula for producing the raw material from which people make their careers. But turf must be defended. On a small scale, you can only publish your research if you can defend it to the satisfaction of the journal's referees. And on a large scale, a research program depends for its funding and other resources on its reputation in the larger research community. It is important to distinguish here between two kinds of legitimacy that

research needs. In a narrow sense, the claimed results must be seen to follow from the premises. But in a broad sense, the research topic itself must be seen as legitimate: that is, as novel, conceptually coherent, defensible in its working assumptions, intrinsically important, likely to lead to practical applications, likely to lead to more productive research, and so on. The precise criteria will depend to some degree on the field (engineering is evaluated differently from history), but every field needs someone to put up a fight when the legitimacy of the field's research topics comes into question. And many topics require a great deal of defending, given that the many idealized assumptions, unmotivated choices, and unredeemed IOU's they entail. That is what a visionary founder like Simon, Posner, or Chomsky does. These guys don't just publish technical papers within their field -- what Aristotle would call "esoteric" work, that is, work that is directed to the community of like-minded researchers within the field. They also publish "exoteric" work, that is, work written for a broad audience that explicates the field and defends it against critics, either explicitly, by answering the critics' charges one after another, or implicitly, by providing the field with conceptual and rhetorical foundations that are meant to be understood by insiders and outsiders alike.

These sorts of exoteric apologetics for a field's turf are one more important way in which people become dependent on their thesis advisors (or, indeed, on their advisors' advisors). If you grow up intellectually within the small world of a particular field, you will never be called on to defend the legitimacy of your research topic. You will probably read the founder's exoteric texts, and you will learn to talk the field's rhetoric, but you will probably not have occasion to really internalize the arguments of the field's opponents. Many people reach mid-career in this position, and I believe that it induces in them a kind of vertigo: they have staked their careers on the continued viability of a chunk of turf that they did not create and cannot defend, and if that turf loses its legitimacy then their careers will evaporate. It takes a lot of reading and networking to establish yourself in a different research community than the one you were trained in, and it's especially hard if your training has not encouraged you to develop a robust intellectual life outside the fine details of your particular lab's research program.

This is, in my opinion, a major cause of some of the less fortunate cultural phenomena of research world, including us-and-them stereotyping of other research communities and a tendency to make a virtue of narrowness or to overinflate the real scope and

potential of the field as it stands. I believe it also explains the fury with which many researchers respond to any criticism of the foundations of their research enterprise. On one level, the organizing ideology of the turf routinely caricatures opponents as irrational, unscientific, etc, so that critics are heard to be saying things that are literally crazy. After all, most people's fields seem like whole universes to them, and networking is very often confined to people who share the same ideology. On another level, the researchers themselves are unconsciously terrified that their careers will explode if the criticism succeeds. As a result, they are motivated to exaggerate the extent to which the real concrete results of the research program have established the truth of the intellectual school within which they work. These pathologies are not universal, of course, and they vary greatly in their intensity. By describing them, I want to help you identify them and avoid falling into them. I particularly want to warn you against cults of personality. Too often people in the research world are honored in proportion to the amount of turf they created, and not in proportion to their intelligence and goodness. If you can shake off this bad habit then you can start honoring the right people, and honoring them in the right way.

(9) Institutionalization

When you are a student, you tend to take for granted the whole institutional framework that you are being socialized into. You might complain about it, and you might even spin conspiracy theories about it, but you do not have the information that would be necessary to understand what the institution really is and how it really works. This article is intended as part of the solution to that problem. Having explained how research institutions work on a micro level, then, I want to explain where they come from. Let's take a simple case: a workshop. You could start a workshop yourself; I explained the procedure back in Section 6 under the heading of "intellectual leadership". If you can round up a critical mass of attendees, then you just do it. Your workshop meets, everyone is happy, and the idea circulates of maybe doing it again next year. Maybe someone else takes the lead, hosts it in their own seminar room, and so on. If enough people keep on feeling like the workshop is worth their time, then maybe it takes on a life of its own. If your emerging theme happens to define an expanding universe, then your workshop will grow. Twenty people might attend the first year's meeting, forty people the next year, a hundred the year after that, five hundred the year after that, and so on. At that point you probably call it a "conference", and maybe you and the other central ringleaders organize yourselves into some sort of

standing committee. Maybe you start an organization, a mailing list, or whatever you build consensus around. Your emerging theme has been institutionalized.

Notice something important: at no point did you have to ask anybody for permission. You just did it. It's a free country, so you used your freedom of association to associate with other researchers who share your interests. You can accomplish a great deal this way. But this is just the beginning of the story. The next step comes when you start a refereed journal. This is something else that you just do, although now you need to persuade a publisher that a critical mass of interest exists to make the journal work as a business. You start a journal in exactly the same way that you organize a workshop: having already built a network, organized some workshops or conferences, etc, you circulate a draft proposal to the ten people whose names everyone would most expect to see on the journal's board of editors, and if you feel like the proposal has some energy behind it then you go ahead. The people in your network will welcome the new journal because they don't feel their papers are being refereed fairly by the existing journals; your journal will ensure that the referees, while presumably maintaining high standards, will at least comprehend the papers and thus be able to judge them fairly.

Above all, a journal gathers up and organizes a community of people who share a complex of research problems, so that everyone can at least anticipate that the referees will regard their problems as legitimate, even if they do not agree with the details of the research itself. That is the service a journal provides to its contributors. In this way, a journal frees its contributors to write the papers that they really want to write, and it ensures that their vitae will now fill up with bona fide refereed journal articles. Of course, the value of those vita entries will depend on the larger community's evaluation of the quality of research in the journal, and for that purpose it will still be necessary for the emerging field's founders to engage in the exoteric apologetics that I explained above. Even so, a journal does a tremendous service to a community by enabling them to be the judges of one another's work.

A journal is a step on the road to institutionalization, but it still does not explain where resources come from. Let us consider one type of resource, probably the most important of all: job positions at universities and other research organizations. (These job positions are often regrettably called FTE's, for "full-time equivalents", since it is somewhat common for someone to be appointed half-time in each of two different departments.) Where do job positions come

from? In the case of universities, they come proximally from deans. When resources become available at the overall university level, the deans engage in politely savage warfare to lay claim to some new positions, and then they allocate the new positions among the departments in their domain. Meanwhile, each department tries to help the dean by describing in compelling terms the turf that is opening up at the cutting edge of their field. As your research area becomes institutionalized, your collective job is to work together to define the emerging turf you see ahead of you, to make the case for this turf seem compelling to your dean, and to help your dean make the turf seem compelling to the university hierarchy. That is where job positions come from. The process is not always sweetness and light, because much of it takes place in committees, different subsets of whose participants are angling to define their own research area as the Next Big Thing for the allocation of job slots. An ascendant field can find itself laying claim to literally dozens of job slots in a period of a few years, and at each step the field's members will be working their networks furiously to produce a steady stream of high-quality candidates for the jobs. Maybe this is how you got your own job.

(10) Routinization of charisma

Now that I've explained how to institutionalize the new research area you've founded, notice something important about institutions: they arise through individual initiative. This fact has many consequences. When you begin your career in research, you will encounter a landscape of already-established institutions -- they will be called "fields", "journals", "conferences", "agencies", and so on -- and every one of those institutions will have arisen through exactly the same kinds of individual initiative that I am recommending to you. Someone built a network, articulated an emerging theme, organized people around it, connected the emerging constituency with a supply of resources, and created new organizations. Those new organizations then settled down and took on a life of their own.

Institutionalization thus entails a process of maturation: from the initiative of a founder to the more anonymous settled patterns of the long term. Max Weber called this process "the routinization of charisma". The founder acts as a kind of entrepreneur, articulating a discourse for the field and creating turf within which others can pursue their careers. As a result, institutions often retain the fingerprints of their founders. If the founder's overwhelming imperative was to defeat an existing establishment, that imperative will probably continue to structure the field below the

surface. If the founder's overwhelming imperative was to secure the patronage of military funding agencies, then research problems will probably continue to be framed in that way after the founder is gone -- even if nobody realizes it. If the founder was a poor organizer or had a personal preference for a chaotic institutional style, then that style may persist for decades afterward. Nothing is inevitable, of course, but institutional patterns do tend to persist once they are put in place. And these patterns originate with the founder, and with the opportunities and challenges that the founder originally confronted.

What does the routinization of charisma mean for your own career? Several things. (1) Don't be fooled by the sense of permanence that every institution projects. Your field's founder -- and especially the founder's students -- codified a fragmentary mess of ideas into survey papers, syllabi, and textbooks, all of which are supposed to look seamless. They're not seamless, though, and you should assume everything is much less stable and coherent than it appears. (2) To find the seams, you should study the history of your field. Go back to the founding documents, and get old-timers talking on social occasions. Understand the context in which the field was founded, and look for left-over patterns that are no longer relevant in the present day. It's alright to have respect for founders, but realize that they are mere human beings, products of the times and places in which they lived. (3) When you do discover these obsolete patterns, deprogram yourself. You will inevitably have ingested a sprawling network of unarticulated assumptions into your own thought patterns, and if you can liberate your mind then you can improve your research. (4) When you start creating institutions yourself, be responsible. You don't want your personal quirks -- or your short-term opportunism, rivalries, and greed -- to be transformed into settled canons that get taught to generations of unsuspecting students.

(11) Imperialism

In order to grow, a research community must create more turf -- that is, broader and broader territories of legitimately researchable topics that the community's members can publish on. Because turf is not a fixed quantity, it is often possible to create new turf within the existing boundaries of the field. In this sense, turf is "nested", meaning that people build their careers and reputations by mapping out territories of researchable research topics within the broader continent that the field's founder(s) had already mapped. Thus, for example, the turf of artificial intelligence, having been mapped out in a general way by Herbert Simon and others of his cohort, subsequently developed well-

defined subterritories, such as AI subfields of "planning" and "machine learning". In each case, a student or student-of-a-student of one of the field's founders made their career by institutionalizing the new subfield: articulating an emerging theme, building a network around it, organizing meetings and journals for the network's members, and so on. There is nothing wrong with this, of course, if it's done well. I just want you to see the pattern. Similar things have happened in many other fields.

Of course, I do not mean to suggest that the process is mechanical, or that its success is guaranteed. The AI subfields of "vision" and "robotics" for example, ended up being institutionally outside the AI community, simply because the people who were doing well-regarded work in those areas were largely situated within other communities, such as neuroscience and mechanical engineering. So the boundaries between different research communities are variable.

And that brings me to the concept at hand: imperialism. One way that fields create new turf is by applying their organizing concepts and methods to subject matters that have historically been the "property" of other fields. Economists of the dominant neoclassical school, for example, have gone to great lengths to portray all phenomena of human life, from education to child-rearing to the fine details of individual cognition, as examples of neoclassical ideas about economic rationality and allocative efficiency. Scholars in the fields that they have invaded, sociologists for example, are often horrified by the strange and extreme violence that the economists' formalizations appear to inflict on their proprietary subject matters, and much gnashing of teeth has ensued, together with some genuine attempts to build bridges. Given the workings of the institutions, however, sniping at the invaders does little good. So long as they can institutionalize themselves, establishing organized research communities whose members are called upon to evaluate one another's work, external criticism must be taken to the larger and slower court of public debate and institutional review.

Economics is probably the most imperialistic of all research fields, but the process is nearly universal. Careers require turf, and they require coherent communities that can collectively defend their turf. So many research communities try continually to apply their overall "story" to new subject matters. These campaigns can lead to faction and warfare. Movements can develop pathological ideologies to justify their imperialism, in extreme cases labeling other work as "old-fashioned" or denigrating any allocation of resources to others as "lowering

standards". Other cases are not pathological at all, and simply represent healthy competition. The dynamics are complicated, and they are hard to see, except from the standpoint of the highly-networked individuals who staff academic hierarchies and sophisticated funding agencies. To watch them happening, however, all you really need are some basic concepts (like the ones I am explaining here) and the disposition to build far-flung professional networks.

(12) Segmentary politics

As the last several paragraphs suggest, political life in the research world consists largely of contention for resources among various research communities. To get some perspective on these political processes, it helps to understand the phenomenon that anthropologists call segmentary politics. Let us imagine for the moment (simplifying greatly) that society is organized hierarchically: households belong to neighborhoods, which belong to towns, which belong to regions, which belong to nations, which belong to broad cultural groups. If you look carefully at a town, you might find that the people in adjacent neighborhoods are continually struggling with one another. But if one town attacks another, those conflicts might be cast aside as everyone rallies to the defense of their town. Rivalries among towns might likewise subside as tensions arise between regions, but these tensions might dissolve temporarily when war threatens between nations, and so on. Each element of this picture -- a household, neighborhood, town, region, nation, or broad cultural group -- is called a "segment", and segmentary politics consists of an endless negotiation of conflict and solidarity among adjacent segments. Of course, the picture can be more complicated when groupings cut across borders, for example in former colonial areas where national borders are randomly related to the borders among cultural groups. But even the simple picture is useful as an antidote to the even simpler picture of undivided national loyalties.

As you start participating in the institutional life of your field, you will probably notice segmentary politics yourself. Individual members of a department may dislike one another, but they may find it in their interest to remain allies in the department's factional struggles. Those factional struggles may in turn be put aside when the department is threatened in some way, or when various departments are making their case for increased resource to the dean. Within the invisible college of a research community, likewise, segmentary politics might motivate opposed tendencies to pull together long enough to present a unified front to a funding agency that is thinking of starting a new

program in their area. And the different schools of thought within a discipline might organize to fend off imperialistic assaults from other disciplines around them.

Segmentary politics is distasteful. In describing it, I certainly do not mean to praise it. You will probably find yourself engaging in it for self-defense if nothing else. But your real job, in the long term, is to transcend it. That is what networking is for. The broader and stronger your network, the less subject you are to the randomness of people's local rivalries. This is one reason why I have editorialized here against disciplinary bigotry: the too-common stereotyping of one discipline by another. The argument against bigotry can be generalized: the conflicts at every level of the segmentary hierarchy are usually organized by stereotypes that have arisen over years, if not decades. Some of these stereotypes may perhaps be justified: despite all of your own best efforts to identify shared values with people in various fields, there may remain certain intellectual orientations that seem completely worthless to you. But at least these will be considered opinions, or as considered as you can make them, and not the uncritical acceptance of other people's stereotypes. And you should remain open, looking for previously unsuspected points of intellectual or moral contact with fields that have previously seemed alien to me. By maintaining this attitude of openness, you can avoid mindlessly closing yourself off from potentially new and constructive directions of networking.

(13) The role of rational debate

I've been talking about "politics", but many people at the beginning of their careers wonder what "politics" means. After all, many people equate politics with corruption, and they feel as though engaging in politics means instant damnation. It is important, therefore, to get a positive conception of politics. A good place to begin is with the role of rational debate. To make the problem concrete, let us imagine a faculty meeting where decisions are being made about which candidate to hire for a job. Most such meetings are conducted according to a formal rulebook such as Robert's Rules of Order that gives everyone a chance to make motions, offer arguments, call for votes, and so on. In that sense everyone is formally equal. But we all know that other things are going on behind the scenes. People come into the meeting with their agendas, their coalitions, and so on. What, one may well ask, is the purpose of holding a rational-looking debate, when the fix is probably already in?

Implicit in this way of asking the question are two stories. On the first, naive story, everyone has an open mind and wants only the best for the school and its students. The naive story suggests that the meeting will be a shared, rational inquiry into the outcome that is best for everyone. On the second, cynical story, everyone is angling for power. The cynical story suggests that rational-looking debate is purely for show, and that the outcome is already set. In fact, the reality varies a great deal, and is almost always a mixture of the two stories. A healthy academic department will be somewhat fluid in its politics, neither strictly hierarchical nor rigidly factionalized, but consisting of a shifting map of different groupings who see things in different ways, and who need to remain on good terms with one another because future issues may require them to form unexpected alliances. In that environment, rational debate does serve a purpose: most issues will have their undecided swing votes, and whoever communicates best with those swing voters will win. Of course, not every department is perfectly healthy, and human beings will always have failings. If you are on the losing side of a harsh political division, then your goal should be to leave, and networking is the best way to go about that.

Whatever the case, you should understand that "politics", whether naive or cynical, always starts with the commonalities that people have established in their discussions with one another. If you don't want to become enmeshed in "politics", in the negative sense of that word, then you should cultivate the skill of identifying points of intellectual overlap with other people. Don't let your pride get in the way by defining your intellectual agenda in one inflexible way. I'm not asking you to compromise your values, or to pretend to believe things that you really don't. There are lots of ways of explaining various aspects of your intellectual interests, and you will navigate in political space much more readily if you decide to articulate the versions of your interests that establish points of contact with particular people. Once you do this, the dichotomy between the naive and cynical pictures of politics starts to break down: you will make common cause with people in an honest way, and they will understand that you are on their side. Political coalitions will emerge in a natural way, and you will be in the middle of them. I will discuss these articulation of commonalities further in the next section.

(14) Reverse engineering

I want to start the transition to the final section on ethical issues by making explicit a concept that has been implicit at many points along the way. In your new career as a researcher, you are entering a

complicated set of institutions whose participants occupy a variety of different positions. You have to deal with these people, and you will get things done by building consensus with them around ideas and projects that you find important. Because these people have different positions than yours -- department chair, dean, funding agency program manager, PhD student, journal editor, etc -- communication with them will not be automatic.

Here is a way to think about it. Everyone has stuff going on in their heads -- questions, concerns, agendas, precedents, peer pressure, and so on -- and you can communicate with people better if you understand how they work. Partly this means understanding them as individuals, with their own backgrounds, histories, ideas, peculiarities, whatever. So if you're going to talk to someone, and something important is at stake, you should try to talk to someone else who knows them first. That said, though, much of what's going on inside people depends not on their personalities but on their positions. Every dean has certain concerns, and so does every PhD student, every department chair, and so on. If you are talking to someone whose shoes you've walked in, a PhD student for example, then you have a small chance of empathizing with their concerns (assuming that you haven't forgotten entirely what it was like). But if you are talking to someone whose world you cannot imagine, such as a dean, then you are likely to make mistakes.

The concept you need is reverse engineering: figuring out what the people are likely to care about, and then speaking to that. I am not talking about manipulation, and I am not talking about telling people what they want to hear. The point, rather, is to anticipate what issues they people will have, and to make sure that what you're proposing takes those issues into account. Here is an example. In Section 9 on job-hunting above, I described one way to write a letter of recommendation: gather all the good things you can think to say about someone, and organize those good things into a coherent story. That's a pretty good formula. But a better formula is to start from the concerns of the people who are likely to be reading the letter. universities and other research institutions are full of evaluation processes, and central to all of them is a dilemma: people are made to prepare defensible evaluations of research in fields where they have little or no expertise. Everybody realizes that this is a problem, and almost everybody is responsible about reaching beyond their own knowledge. That is what letters of recommendation are for: they are evaluations from people who know the work. Yet those letters don't fully solve the problem. Someone has to

interpret the letters and convert them into up-or-down decisions that they can justify. What to do?

The major idiom for these justifications, it turns out, is comparison. Is this person the best in their field? How do they compare to other people at similar levels of advancement in the field? How does this program stand in some magazine's reputational rankings? That is how people like CAP (the Committee on Academic Personnel that I mentioned above) will be thinking. A letter-writer, therefore, is well-advised to speak that same language. An expert recommendation letter will say things like, "In preparing this letter, I conducted an informal exercise in which I assembled a list of several other prominent scholars at this person's level of advancement, and in doing so I found that this person's work is clearly ahead of the pack in terms of this, that, or the other thing". That's reverse engineering.

The concept obviously generalizes. In various sections above, I have explained what various sorts of people are worried about. Department chairs, for example, have to get courses and committees staffed. PhD students on the sidelines of faculty hiring want to get faculty hired who can teach the courses they want to take. In each case, you can accomplish a great deal by showing that you are aware of these concerns. You don't have to make them your responsibility, but you should not try to evade them or get around them. If someone has a valid concern, then you should get that concern on the table and cooperate in addressing it. The situation is harder, of course, when you're dealing with someone whose concerns are not valid, or who is presenting concerns as valid that are actually disguises for other agendas. In those cases all you can do is put your own valid concerns on the table and negotiate. But don't get into the habit of acting like everyone else's concerns are just negotiating positions. That's not a healthy way to live.

(15) Demographic tidal waves

When we speak of the university as an "institution", the suggestion is that things stay pretty much the same. But the institution does change, and you need to understand how. One source of change is information technology, but a much more important source of change is demographics. Let me just consider the United States. After World War II, a huge number of soldiers came home from the war and went to college on the GI Bill. The university system expanded tremendously to accommodate this new wave of students. Those same students also had a tremendous number of children, the famous "Baby Boom", and when those children grew up, the university system kept expanding to accommodate them as well. The

federal government's research establishment grew explosively at the same time, and much of this money went to universities. These generations -- the GI Bill and the Baby Boom -- took the concept of an expanding universe for granted. The job market was so strong that they could take chances with their careers. Beginning in the 1980s, however, that picture changed. Student numbers stopped growing dramatically, and the academic job market contracted accordingly. Qualified college teachers were so numerous that many colleges moved away from tenure-track faculty and toward exploited part-timers. Academia started getting a bad reputation as a career choice.

That situation is about to change, for two reasons: (1) the Baby Boom generation is going to retire, and (2) the Baby Boom's grandchildren are headed to college. The numbers in each case are overwhelming. The University of California, for example, plans to hire about 7,500 new faculty members in the next ten years -- which is more faculty than it employs right now. In fact, higher education planners assert that it will be physically impossible to accommodate all the students who will be ready for college over the next decade. Despite what you have heard, therefore, this is the best time in human history to be entering the research field. The networking skills that I have been presenting are crucial when the job market is scarce, because the Baby Boom generation's easygoing career strategies certainly don't suffice. But networking skills will also be useful during the good times ahead, when the university will be completely remade in a short period.

14 Positive Leadership

The last section points toward the ambivalent nature of the research world, and as you become well-connected you will start to face the moral issues that the professional world inevitably brings. Before talking about those moral issues, I want to make sure that the bad dynamics I've been describing haven't tempted you to cast off the optimistic and constructive tone of my advice in favor of the negative stereotypes about networking that prevail in the culture. Don't become a cynic. It will make you a bad person and a bad influence on others. You really must believe this: if you think that the whole universe is evil then you are evil yourself. I do realize that some people are out there selling their souls. And the expanding universe of an emerging discipline will always attract opportunists who are gung-ho about networking and whose research is simply a shallow excuse to keep their hand in the network-building game. That is not the way of life that I am recommending for you, and I

want to make sure that you distinguish between this negative approach to networking and the positive and constructive approach that I have been describing. The main purpose of this section is to make the distinction between the negative and positive approaches to networking as clear as possible, in order to help you develop a clear ethical sense in an unfamiliar professional world.

** Research institutions*

Let us start with an aerial view. Imagine yourself in the sky looking down on millions of researchers, in every field, all continually building their networks, organizing their conferences, editing their journals, interviewing for jobs, and so on. I have described the process by which these people institutionalize their emerging fields, but the idea of an institution has a more fundamental meaning as well. Think, for example, of the institution of a journal. No laws anywhere explain how journals ought to run. Each journal sets its own rules, based on the sensibilities of the people involved and the precedents that are available from existing journals that the people are already familiar with. A journal editor might introduce small innovations such as double-blind refereeing (where the referees are not told who wrote the papers they review) or a department of the journal for short papers. A really energetic journal editor might even organize a more radical change, such as a shift to online publication. Nonetheless, the journal as an institution does not change much, for the simple reason that it is held steady in a force field of the intersecting incentives that other institutions create. The academic promotion process, for example, demands peer review as a formal method of evaluating a candidate's research, and so few researchers will submit their research papers to a journal whose procedures do not fit that model. A journal establishes its identity and credibility in large part through the list of prominent researchers who are willing to be identified with it, and so every journal will have a list of prominent people on its title page, whether an "editorial committee", "advisory board", or what-have-you. Authors expect one another to give credit where it is due, and peer review gives these expectations teeth, so the articles in journals are festooned with scholarly apparatus. Because these converging forces remain much the same over time, the institution of the research journal remains much the same as well.

The same goes for the other institutions that organize life in the research community, such as the conference, the job interview, the grant proposal, the advisor-student relationship, and so on. Over time, the participants in every institution accumulate and pass

down a body of knowledge about how to pursue individual and collective goals within the framework that the institution provides, and the whole purpose of this article is to explain this body of knowledge in very explicit terms, so that you don't have to learn it by trial and error. Everybody in the research community, or at least the vast majority of people who are successful in it, learn and practice this knowledge to the point that it becomes second nature. If you study them from your aerial perspective, you will see them building networks that you could easily imagine mapping -- and that some scholars actually do map as part of their own research. As publications and communications become increasingly electronic, you could imagine constructing these maps automatically.

It's important to understand how profoundly the buzzing activity of network-building that you observe is organized and supported by the institutions. Recall, for example, the role of the library as a sort of catalog of potential intellectual friends. Most people in the real world do not order their friends from catalogs, for the simple reason that they do not create the same sorts of elaborate public personae that scholars create when they publish their research in journals. In fact, most professions do create incentives to build professional networks, and many sorts of organizations and directories do exist to support networking in business and politics, for example. Even so, few professions provide the extraordinary level of institutional support for the process that the research community provides.

The dynamics of networking in the research community, however, do not remain the same over time. The Internet has certainly accelerated the process through electronic mail. In some fields the process has also been altered substantially by the Web, although I remain struck at how little effort the average researcher puts into building a Web presence. Since most researchers already know personally the finite world of individuals whose opinions of their work really matter, and since libraries already make their publications available to the few people who don't get them by exchanging drafts, researchers do not have strong incentives to create an elaborate home page. That's how powerful the existing institutions are: they bond people so tightly that even the Internet does not radically change the dynamics. The Internet makes it easier for people in outsider universities (such as the former students of people at the insider universities) to stay in the loop, and as I say it speeds everything up. But the fundamental phenomenon, the one that drives and shapes the research community's day-to-day practices, is the complex of institutions that rewards some activities and not others.

That said, I do think that the institutions of research have changed in one important way over time. From the aerial perspective, you could say that the temperature has gone up. The activity of forming and reforming networks is more frenetic than it used to be, and less predictable. In the old days, fields were stable and hierarchical, and they had strong boundaries. You were trained in a field, changing fields was almost impossible, and the concept of interdisciplinary research did not exist. Every field had two or three leading journals whose editors were kings, and they had one major conference, held once a year, where faculty introduced their students to the faculty of other departments in the patriarchal hiring system. That old world is hardly gone, but it is changing. You could say that we are moving from a world of conferences to a world of workshops. Where conferences are large and permanent, workshops are small and temporary. Some workshops are held year after year, but others are transient by design. A conference is an immutable fixture in its participants' lives, but workshops are organized more or less spontaneously whenever network-builders such as yourself manage to articulate emerging themes that motivate a critical mass of their peers to abandon their research for a few days to participate. Workshops are indifferent to the boundaries of fields, and they allow people to join multiple research communities, and to migrate freely from one research community to another as they seek out new research topics that fit their interests and talents. Although it is not without dangers, I think that this shift toward a more dynamic research community is basically a good thing, not least because it calls on everyone to make their own fate by engaging with others.

** Disagreement and pathology*

That is the big picture, and I think it is a fairly hopeful one. Returning to earth, however, I do appreciate that you will have to deal with the negative and pathological aspects of the institutions as they actually exist. Take, for example, the simple fact that many of your fellow researchers will not share your research interests, and more importantly your values. Although networking is very much a process of picking your friends, nonetheless you will often find yourself sharing a committee or a department with people who you just plain disagree with. What to do? I have given part of the answer already: articulate commonalities. Find something -- anything -- that you agree with them about, and talk about that. Create a human bond on any basis at all, have a social conversation with them about just those topics, and the rest will follow much more easily.

The next step in dealing with people you disagree with is to learn their arguments. You don't know your own arguments until you can argue the other side. The history of philosophy makes clear that intellectual progress requires that evenly matched schools criticize one another in detail, so that each side feels compelled to overcome the criticisms that the other side has presented (see Randall Collins' book "Sociology of Philosophies", mentioned above). You should live this deep truth in your own life by really learning the arguments of the people you disagree with. You should also search fearlessly for valid points that your opponents do make amidst their errors. Make sure that you aren't denying those valid points, just because your opponents make them. That sort of denial is very dangerous, and you should make a big point of avoiding it. For example, if you're an economist you should admit that markets sometimes fail. If your work is situated on the political left then you should admit that crime is bad. And don't just admit these points: embrace them. Don't just treat them as nasty counterarguments that you immediately trounce with your brilliant come-backs. Rather, accept within yourself that the valid points are valid, and carefully disconnect them from the false ideas with which they have formerly been associated. By submitting yourself to these disciplines, you will accomplish many things. You will present a smaller target to people who disagree with you. You will confound their expectations and throw them off-guard. You will minimize unnecessary polarization and avoid foreclosing potential coalitions. And you will clean the junk out of your own arguments. People aren't stupid, and you need to believe that the people you care about respect intellectual honesty. The arguments that you can't explain away will compel you to invent new arguments, which after all is your job.

Of course, all of this talk about learning arguments requires people to fight fair. But many people, as we all know, do not fight fair. To deal with these pathological people, you need six ideas:

First, you should distinguish between people who are irrational in a general way and people who are irrational on specific topics. When people are irrational on specific topics, it means that they have been hurt in the past and are afraid that they are going to be hurt the same way again. Oftentimes, you will do something reasonable that superficially resembles a bad thing that some other crazy person did in some other situation. For example, you might propose a new course that falls somewhat outside the usual framework of the curriculum, not knowing that your department went through years of warfare over the framework of the curriculum before you got there.

The extreme response you receive from otherwise rational people will be out of proportion to anything you actually did. When you do something reasonable and encounter an irrational response, therefore, one approach is to stop and figure out what bad experience the other person has had. Then you can assure them that you aren't going to do the same bad thing that the crazy person did earlier.

Second, you should never try to change or fix pathological people, and you should certainly never persuade yourself that your personal happiness or success depends on changing or fixing them. Fixing pathological people doesn't work in personal relationships, and it certainly doesn't work in professional relationships. Release the miserable people to their misery, refuse to let them into your space, and carry on with your life.

Third, understanding where the pathologies come from will make the pathological people easier to deal with. For example, you will find many assistant professors engaged in pre-tenure psychosis, in which the uncertainty of the tenure process causes them to become delusional, adopt self-destructive defenses, play maladaptive politics, spin conspiracy theories, and generally mess themselves up. Not having been admitted to the inner circles of the institution, they have not sufficiently internalized how the institution works, and so their imaginations fill the vacuum with whatever basic beliefs about the world they happen to have gotten from their childhoods.

Fourth, you need to tell yourself that pathological people behave in pathological ways because they do not understand the positive and constructive view of the world that I am explaining in this article. Pathological people are pathological because they believe that the world is a fundamentally bad place, and whenever you feel the urge to send them to hell you should understand that they are already living in hell. Of course, when you are confronted with hard-core power freaks it can be hard to tell yourself this. If the power freaks have dug their claws into resources, if they have built an empire of cronies and serfs, if they have recruited others into their distorted view of the world, surely there is a real sense in which they have benefited from their evil, is there not? No, there is not, and this is what you have to tell yourself. When Jesus said that the world is corrupt, and when the Buddha said that the world is illusion, this is what they were talking about. Pathological power freaks think they are in control, but they are hallucinating. If you convince yourself that your success and happiness depend on wrestling control of those hallucinations yourself, then you have locked yourself into the same perdition as

they have. Let go of them. You will make your success and happiness through networking in ways that are not yet revealed to you, and that have nothing to do with the illusory power that pathological people appear to hold.

Fifth, if a pathological individual happens to attack you emotionally, whether through shouting fits or sarcasm or accusations or whatever, you should learn the proper method for getting the toxins out of your system. The key is to revisit the specific details of the situation. You can do this with your notebook or with a trusted personal friend (preferably not a professional colleague). Simply recount the events in detail. By "detail" I mean the specific actions and words, step by step. Think of yourself as extracting venom from a snakebite, removing each bit of the venom by deliberately revisiting each element of the experience. If you were emotionally hurt, however slightly, you will find yourself tending to describe the events in a vague way, for example by giving paraphrases rather than the actual words or by skipping over details that don't seem important. This is a mistake. The purpose of emotional abuse is to subvert the victim's capacity for rational thought, and you will only regain your rational mind if you carefully extract the toxins from your system. If you find yourself howling for revenge, then you haven't gotten all the toxins out yet.

Sixth, the purpose of networking is to let you escape pathological people by building your own supportive community. The stronger and more extensive your community, the less power the pathological people will have over you. Your network is your personal intelligence system. Your conversations with other people in your network will help you understand how different organizations do things, and they will broaden your thinking by helping you internalize a wider range of perspectives on the institutions and the research. When a network is functioning properly, a kind of electricity runs through it: the excitement of the research, the affirmation that comes from sharing that excitement with others, and the confidence that comes from a continually updated affirmation that your research is finding a real audience. The electricity of a functioning network makes pathological personalities seem less important.

** Leadership*

Having declared your independence of pathological people and their established ways of doing things, how *will* you achieve the personal success and satisfaction that you seek in your career? The general outlines are probably clear enough from my advice so far: build a network, articulate an emerging theme,

organize institutions around it, build another network, articulate another emerging theme, organize institutions around that theme, and so on. It's a cycle. With each pass through the cycle, you will ascend to a new plateau in the professional world, and in your career. You will then build networks and organize institutions by cooperating with other people who occupy similar plateaux, having built their own networks and organized their own institutions back in their home territories. And then you will use that plateau as a base from which to ascend once again.

The crucial intuition is that the emerging themes will become more abstract with each pass through the cycle. When you organize your first conference panel or journal issue, you will probably choose an emerging theme that brings conceptual order to the work of a half-dozen people. That's fine; it gets you started. Once you gain the perspective that a round of professional organizing affords, however, you will find yourself articulating bigger and more encompassing themes, ones that bring order to the research programs of scores or hundreds of people. Examples of abstract themes that help large research movements to coalesce include "neuroscience", "cultural studies", "communications policy", and "human-computer interaction" -- in other words, the sorts of phrases you see as the titles of journals and conferences. This is where journals and conferences come from: every one of them started when someone followed the procedures that I am describing. The genius of research as an institution is that it supports this kind of incremental growth: as a new researcher it is impossible to engage with the voices of every researcher in the world, so the institutions are arranged to let you pick a few voices -- the ones that are closely related to your dissertation topic -- and engage with them. Then as your career progresses you can engage with broader and broader ranges of voices. The meritocracy of research starts with peer review, but its essence lies in the opportunity that it provides everyone to ascend in their careers by organizing networks around progressively larger themes. The justice of the system is that engaging with diverse voices makes you honest: you are compelled to reconsider your assumptions on ever deeper levels, and this makes your work more useful to everyone.

Of course, intellectual leadership isn't simply coming up with a name, but talking to everyone and developing a language that lets them all recognize themselves as members of an emerging community. This is leadership in its most general sense, and done honestly it is the best kind of leadership. A leader always has a couple of activities in the works that gather people around emerging themes -- and not just any people but the people whose work seems in the

best sense to represent the future. At any given point, then, you will always be involved in organizing a conference, convening a committee, starting a journal, putting together a multi-site grant proposal, founding a research center, or whatever makes sense at a given time. If you're not involved in any such activities then you should figure out what the problem is. Reconnect with your network, articulate emerging themes, build consensus, and move forward.

** Money*

An especially important type of intellectual leadership concerns research funding. Every funding agency, whether the government or a private foundation, maintains a dialogue with the research community to help articulate the research program that they want to fund. Your job as an intellectual leader is to mediate this dialogue by talking both with your network and with the funders about where everyone sees things going. When you talk to people in your network, you should constantly update your map of the community's collective research agenda. Elicit each individual's research agenda, and then put those research agendas together into orderly wholes. Keep lists of research topics that come up in conversation, sort the topics into outlines, and tell clear stories that give the outlines a unified sense. This is what emerging themes are for, and by continually working to articulate emerging themes you will evolve the language that the research community and the funders use to talk to one another.

This conversation can be organized in many different ways. The National Science Foundation, for example, is largely driven by the research community itself, and intellectual leaders who can organize workshops and assemble their findings into "white papers" play a pivotal role in the process. The incentives to organize such things are strong: if you write the white paper that NSF draws on in defining a funding program, then it is likely that your own proposal will fall squarely within the scope of the program once it gets defined. Other agencies, public and private, are directed more by their own agendas, or those of their patrons, but even in those cases your job is much the same: staying in the conversation and continually offering a compelling vision of the future direction of research, based on your honest sense of where the ideas are heading. Of course, a dialogue by definition goes both ways, and you also lead by articulating the genuine insights in the funders' agendas and synthesizing them with the bottom-up development of agendas in the research community.

This process may sound phony, and it can certainly become phony if it is done badly. But believe it or not,

the leaders of funding agencies are usually very intelligent, and their opinions do usually reflect real insight. Of course, a failure of leadership can result in a situation where a powerful funding agency leads the research community around by the nose, imposing arbitrary agendas on it from the outside. But avoiding this kind of failure is precisely what powerful leadership is about. Powerful leadership is far-sighted enough that the relationship with funders is based on a shared vision of emerging directions for the research.

Now, many people do not get excited at the prospect of articulating research agendas and conversing with funding agencies. They do not see themselves as leaders, and they would rather stay in their labs and libraries doing their work. I say fine. It's a free country. Nonetheless, you have to understand how these things work. Money for your research does not materialize from the clouds, and you don't want to be stranded when the agenda-setting process strays away from the topics that interest you. Participating in the process, if only at a basic maintenance level, means that you retain a degree of control over your life, as well as an early-warning system that prevents you from getting stuck later on. But more fundamentally, as I have emphasized throughout, the networking process is good for your own thinking. Networking serves many functions, but the most important is as a process of collective cognition. When you talk to everyone and listen to their research agendas, and when you write all their agendas down in front of you and look for the emerging theme that brings order to them, you are stimulating the most crucial functionality of your mind: the largely unconscious ability to synthesize fragments into coherent wholes. Down deep, everyone has a drive toward wholeness. This is the force that makes you a more or less integrated human being and not a schizophrenic mess, and it is also the force by which like-minded individuals cohere their thinking and form movements that are intellectually and institutionally stronger than the separate individuals that make them up. In a sense, then, deliberately talking things through with everyone in your network simply amplifies a force toward wholeness that is already operating in everyone's personality. The difference is that it's now a force for the collective good, as well as your own.

** Fame*

If you have been following my advice, then you are likely to encounter two perplexing types of situations: meeting famous people and becoming famous yourself. Fame is second only to money in its apparent power to make people irrational, and so it will help if you understand where this apparent power comes from, and

how to avoid it. Presented with an opportunity to meet someone who's famous, many people turn into idiots. They think that meeting this person is a rare opportunity not to be passed up, and they imagine in a very abstract way that something will come from it. The reason for this weirdness is subtle, and it has to do with networking. We want to associate with famous people because we imagine (usually correctly) that famous people have much more wide-ranging networks than we do. Either the person became famous by building a large network, or else they became famous in some other fashion and acquired a network as people started including them in things. In either case, the magnetic pull that celebrities exert derives from the idea that they can connect us to networks that currently lie beyond our reach. Yet for that very reason, meetings with famous people can be strange and pointless. What do you say to someone who (or so you imagine) already knows everyone and everything that you do? If you are going to meet a famous person then you will need to devise answers to that question in advance. There are four basic options:

- (1) Try seriously to network with them. Articulate commonalities of ideas and values. Then figure out what activity you are currently organizing that would allow the celebrity to network as an equal with your other well-connected professional acquaintances. Issue the invitation in a low-key fashion as if nothing very special or unusual is going on.
- (2) Read their book and think intelligently about what the book is really saying. That way you can say, "I read your book, 'A Short History of Bolivia', and I was wondering ...". (Remember to identify the book by its title, to show that you are telling the truth about having read it.)
- (3) Keep it light. One of the downsides of fame is having to contend with a steady stream of pushy takers. Renounce all thoughts of benefitting from the interaction, come up with an insubstantial conversation topic, and be the only person they'll meet today who isn't trying to glom onto them. This is harder than it ought to be, but it's worth trying.
- (4) Avoid the meeting altogether. You've got your agenda; it's working well for you and everyone in your network; and this person isn't located anywhere on your personal radar screen. So why waste everyone's time?

Thinking about these issues in real, practical situations is helpful practice for the really hard part: becoming famous yourself. As you begin networking, you will learn some surprising facts about fame. One is that

fame is relative. You can be famous -- that is, perceived and treated as famous -- in a community of a few hundred people. That means that, much sooner than you think, you will start meeting people who treat you as if you are famous. This can be a very strange experience. You will find people hero-worshipping you, or projecting various purely imaginary qualities (good or bad) onto you, or assuming that you know people and things that you've barely heard of, or treating you as some kind of political symbol. When this stuff happens, your number one temptation is to be a jerk. You may already have met your inner jerk back when people started coming to you for advice, but if not then you will certainly meet your inner jerk now. All I can say is, be ready.

So, should you become famous? If you wish to excel in a career in research, then you probably have little choice. Research requires you to publish your results, articulate emerging themes for your field, and build an extensive professional network, and all of these activities, if done well, lead directly to fame. You do have some choices to make about your participation in activities outside the research world, for example in cultivating a public voice along the lines that I discussed in Section 6. But for the most part, having a public persona is part of the job, and you should think hard ahead of time about what it means to you and what you want to do with it.

In particular, fame affects relationships. As you become famous, you may be distressed to find that you can no longer be friends with some people that you've known for years -- people who have been turned into idiots by the prospect of benefitting from their friendship with you. Then, if that weren't enough, you might also find that you can't seem to make any new friends either, since everyone new is too busy projecting things onto you. Some people will want to be friends with you because of your network, and not because of your personal qualities. Don't let these phenomena discourage you. Your professional networks, after all, are supplying you with large numbers of people who share your values and interests. You are effectively becoming a different person, at least so far as your public persona is concerned. You are knitting yourself into a different network of relationships, and if you have articulated commonalities and emerging themes that genuinely interest you, then your new relationships will be just the ones you want.

** Beliefs*

At several points in this article I have described the self-defeating beliefs that keep many people from

having the careers they want. Dysfunctional beliefs can come from several sources:

- * Messed-up ideas in the general culture, for example the idea that networking is necessarily greasy, dishonest, burdensome, "political", or a substitute for "real work".

- * Political movements that have run off the rails and try to convince everyone that the world is infinitely and hopelessly oppressive.

- * The dysfunctional cultures of particular occupations or workplaces, which claim that getting a job requires you to give up your integrity and commit yourself to work that you do not respect.

- * Dysfunctional subcultures of the research world that arise because people in particular situations -- for example, graduate students or untenured faculty members -- lack the information they would need to distinguish between genuine oppression and random paranoia.

- * Traumatic experiences, such as having your work plagiarized, that leave you forever worrying that the same bad thing will happen again, until that worry blows up into an all-consuming worldview.

- * Child abuse, whose survivors often experience the world as an endless series of abusive situations which they cannot escape.

I want to focus particular attention on one mechanism through which people develop negative beliefs. Most people get socialized into institutions such as the research world without anyone ever explaining how the institutions work. For example, few PhD students ever get explicit lessons on the sorts of career strategies that I have been explaining in this article. What is more, the social world is filled with unspoken rules that keep these things hidden, for example the taboo against boasting or the imperative of explaining one's motives in terms of the general good rather than in terms of self-interest. These unspoken rules help people to get along, but they also make it much harder for average PhD students in complex professional interactions to figure out what is really going on. Most students do acquire up some insight from watching the experts, but they usually do not develop a complex theory like the one I have been explaining here. As a result, they often perceive their social environment in a relatively superficial way.

Let us consider a comparatively mild misconception that can arise from this sort of superficial perception of

the professional world. Some students develop the idea that a professional network is an encumbrance. After all, the more people you know, the more you have to constrain your voice to avoid saying anything that will offend anyone. Isolation is painful, but at least it leaves you free to speak your mind; the alternative is a life of walking on eggshells. Right? Wrong. People who believe such things fail to understand how people change when they articulate shared values. Once you have created a bond with someone based on the values you share, you can go ahead and disagree with them. Having established what you both really care about, you can easily display your agreement on fundamentals before going on to explore your differences on details. If you have not articulated shared values, then indeed you are likely to step on some land mines. The simple fact that they don't know you will heighten the danger of misunderstanding. But once you internalize other people's thinking and allow it to influence your own, these dangers are much reduced. Actively engaging with other people is a way to discover and articulate your own beliefs.

More serious hazards arise as students who don't understand the underlying logic of networking encounter the established power structures of their field -- that is, the networks that have already been built by the people who got there first. Such students often then imagine that the power structures they encounter are immutable. They might listen to the players' conversations, but they don't understand the layers of meaning that people who do understand networking take for granted. Then, based on their understanding of the situation, they devise plans of their own. And because their understanding is imperfect, their plans go wrong. They might try to break into or circumvent the existing structures, only to commit a faux pas or provoke a weird misinterpretation. Or they might try to conform to the seemingly implacable order of things, only to find that they are giving up their integrity and getting nothing in return. They will end up frustrated and alienated, and they will go looking for someone to explain why.

Meanwhile, other students (and faculty with stalled careers) who have screwed up in similar ways will be feeding them negative ideas: the game is fixed, it's all about power, you can't win, everyone is competitive, the whole culture is based on tearing other people down, and to survive you have to join the culture or drop out. Those negative beliefs will always have some slight basis in truth: if you go around looking for confirming evidence, you will certainly be able to find it. But you can find confirming evidence for any belief. The fact is, the people who are trying to sell

you such negative beliefs are a cult. Their end in life is to justify themselves, and to that end they want to recruit you. They are dangerous. You should hand them a copy of "Networking on the Network", and then you should walk away from them until they get some better beliefs.

What exactly is wrong with the cult's beliefs? The cultists believe that the social structures around them are static, and that they themselves are isolated. They believe themselves to be powerless, and because they haven't the faintest idea how power works, they honestly cannot imagine what it would be like to get any power for themselves. Is it their fault? Partly yes, partly no. It doesn't matter. What matters is getting and teaching a more positive view. The fact is, every one of the current power-holders of your field acquired their power through the methods that I have been describing. They built networks, articulated emerging themes, organized events, and founded institutions. Your job is not to attack them, but to build networks of your own. Occupy the new ground that is opening up, and when they retire your network can inherit the world, assuming that you even want it.

Building a rewarding career, then, requires positive beliefs. Along the way, I have described some of the positive beliefs that are necessary in order to approach networking in the most productive and ethical way. These include the idea that networking will pay off somehow in the future, even if the exact mechanism is not yet clear. In the remainder of this section I want to talk about what I mean by "beliefs", and I want to describe some of the other beliefs I think you should have.

When I talk about "beliefs", I'm not talking about the intellectual theories you have in your conscious mind, or anything that you reason about at a clinical distance or write papers about with fifty-cent words. Rather, I'm talking about your fundamental, deep-down way of relating to the world. For example, if you believe -- if you take for granted, if you assume, if you presuppose -- that the whole universe is fundamentally bad, and that people are fundamentally corrupt, then I want you to stay away from me, because I submit that you are unable to approach anything in a positive spirit. You expect that everyone is going to shaft you, and so you are going to give up, or act ironic, or treat everything as a meaningless conspiracy, or go around preemptively shafting everyone else.

I want you to give up those sorts of negative beliefs. Instead, I want you to adopt some positive beliefs. I want you to believe that you will get a good job, that you are going to have a productive career, and that you

are going to build a supportive network of decent and intelligent people. I want you to believe that you will enter into highly productive lifelong collaborations in which all parties fully express their talents. And I want you to believe that you will build a community whose members continually exchange all manner of resources and services, such as job-hunting information and draft-reading.

Of course, when I propose these beliefs, it immediately becomes unclear what "belief" could mean. I do not mean, for example, that you are going to think positive thoughts and then sit around waiting passively for them to become true. I am not calling for a mindless, naive optimism. Nor do I mean that you can just pick people at random and magically turn them into your productive lifelong collaborators. No magic here. Quite the contrary: your good job, productive career, and supportive network are only going to materialize if you get out there and build them. Work is required. The point is that you have to undertake this work in the right spirit. If you treat networking as an arbitrary chore, or as manipulation, or as social climbing, or a matter of sucking up to the powerful (which is itself a kind of manipulation), then you will get a cynical life of phony relationships.

But why? Why do positive beliefs lead to positive outcomes, and why do negative beliefs lead to negative outcomes? Because your beliefs determine what you see. If you believe that you can build a network of supportive people, then you will be looking for supportive people. Because you will be making distinctions, you will gravitate to the right people and you will shun the wrong ones. You won't try to do things that can't be done, you won't try to organize meetings that people aren't going to attend, and you won't try to wake people up who would rather stay asleep. On the other hand, if you don't believe that supportive people exist, then obviously you won't be looking for them. If you believe that people are all manipulative operators, then you will be looking for games and schemes and angles, simply asking yourself which of them best fits the needs of your own manipulations. When people cannot imagine creating the world they want, and believe themselves to be living in a finite, zero-sum world instead, they build a culture of competition and back-stabbing instead of the positive culture they need. They act in ways that cause their beliefs to come true, and then they conclude that they were right all along. It is only when people believe in a decent world, and are out looking for the elements of it, and watching for the outlines of it to emerge from the fragments that they've gathered along the way, that they have a chance of getting it.

So my point here is not that everyone in the world is perfectly good, or that the whole world is beautiful. I have repeatedly explained how you should deal with the evils and pathologies that you do encounter in the world. A "belief", in the sense that I am using the word, is not about the world in general, but about a deeper emotional reality. The world may be evil on the surface, but you have to believe that it is positive underneath. Your job is to cut through the surface junk and build a positive life. This is originally a religious idea. In Christianity it's the idea that you should let go of your own agenda and let God lead you to the life He means you to have. But it also takes secularized forms. In Marxism, for example, it is the idea that, below all the division and oppression lies a deeper reality in which people are sociable and cooperative. Of course, some Christians get so wrapped up in sin and punishment that they forget about the positive aspects of their religion, and some Marxists get so wrapped up in persuading people that they are oppressed that they forget about the positive values of social solidarity that supposedly solve the problem. Likewise, you need to maintain a clear sense that you can build a positive career for yourself, and that the details will become clear once you get out there and start doing it.

My advice should be contrasted with the advice that prevails in American culture, which is to "follow your dreams". I agree that following a dream is better than watching television all day. The problem with a "dream", however, is that you have no way of knowing, at the beginning of your journey, what your ideal life should look like. Lots of people have "dreams" that are completely disconnected from reality. The truth is, the good life that you can build depends on factors that you simply cannot know about until you start building networks, articulating emerging themes, and exercising your leadership capacities. In order to see what opportunities are out there, you need to be open to unexpected possibility. Preconceived scenarios can only narrow your vision.

If you can't come up with a "dream" a priori, then, how should you proceed? What should you steer by? That's what this entire article has been about. Start with a research topic that you find compelling. Do a round of research, hit the library, identify people who should be part of your network, approach those people, talk to them, let yourself change as a result of those conversations, see what themes are emerging in the collective work of your community, follow the directions that you personally find compelling, build networks around those new directions, and repeat. Get yourself embedded in a community of people whose work you respect, and from that embedded point of

view you see what opportunities start to become visible. Nobody can start a new institute, for example, unless a lot of different factors come together. Likewise, nobody can found a new field of research just because they have a "dream" in their head to do so. It may be part of your path to start a new institute or found a new field, or it might not. Let go of those a priori scenarios, and instead look carefully to see what is being offered to you in the real world. Work the process, and let it pull you forward.

Perhaps the most fundamental belief you need is that you have choice in your life. Many people simply assume that their lives are dictated by others, and that they are completely hemmed in by powers beyond their control. This belief is obviously a self-fulfilling prophesy, but that doesn't explain why it is wrong. The underlying problem is a false understanding of the nature of freedom. For many people, indeed for the mainstream of Western political theory, freedom means complete individualistic autonomy -- the power to do just exactly as you please in your own personal zone of total disconnection. This belief system is unfortunate because it provides no way of reconciling freedom and relationship. Relationships, on this individualistic view -- relationships of equality, in any case -- are inherently constraining. At best they represent a trade-off in which individuals surrender parts of their freedom in order to get something else. This is totally confused.

I hope to have presented an alternative view: freedom is something that you discover, that you build, through relationships with others. You build networks around the issues you care about, you grow and change through the relationships that result, you articulate the themes that are emerging in the community's work, and through community-building and leadership you get the resources to do the things that you most care about doing. It's true that this method will never give you arbitrary power. But the desire for arbitrary power is not freedom -- it is a particularly abject form of slavery. If you can let go of preconceived plans then you are free: you can choose whom to associate with, and as you build your network you multiply the further directions that you can choose to go. You also multiply the unexpected opportunities that open up, the places you can turn for assistance with your projects, the flows of useful information that keep you in contact with reality, the surveillance of the horizon that keeps you from getting cornered by unanticipated developments, and the public persona that ensures that people keep coming to you with offers that you can take or leave. That is what freedom is, and it is yours if you will do the work.

** Power*

If you follow my advice then you will acquire power. If you carry around the prevailing cultural stereotypes about power, then you may be surprised at the reality of power when it happens. For example, simply having a network confers power. If you know two people, A and B, who do not know one another, then they might ask you about each other. Is this person smart? A good speaker? Well-suited to serving on a certain committee? That is already a kind of power. If you are trapped in a negative, conspiratorial view of the world, then you will answer these questions in whatever way best suits your own "side" in some imaginary war. You may not even be thinking about whether the person in question is smart, a good speaker, and so on, but rather about whether it suits your private game to be promoting or frustrating them.

You might even take this mode of operation for granted, having picked it up from the culture around you, without stopping to reflect on whether it really serves you. Besides, being asked about the person has made you feel important, and exercising arbitrary authority over them has made you feel even more important. This kind of nastiness can become intoxicating, and paradoxically its root cause is the down-deep belief that you are not powerful, and that your actions have no real consequences in the world. It is in such simple situations -- being asked their opinions of others -- that many people first face up to the consequences of having actual power in the world, however slight. You might serve as a referee for a paper, in which you can rant intemperately without being known to your victim (though the editor of the journal will know perfectly well). You can fail to mention someone's work to someone else even though it was relevant to the conversation. You can go along with stereotypes that distort the seriousness of another field's research methods. And, being intelligent, you can rationalize any of this. After all, I have told you myself to shun negative people, and you can tell yourself that those others are all negative, when in fact they are simply inconvenient.

So right away, early on in your career, the question will arise of what kind of power you want to have. It is good to be powerful, but only in the correct sense of the term. People with the right kind of power, in my view, do not need to manipulate or control others. To the contrary, they are know that they are well-served when others grow and find their own directions, so they happily support everyone in their growth. They don't take responsibility for others' growth, which is a different question. They speak to the healthy part of a person, and they are concerned to draw out and

articulate the brilliant ideas and worthy vision that lie beneath the surface of whatever anyone is saying. For example, they don't try to enroll students as acolytes in their empire-building strategies, but honestly ask what's best for each student's own development, confident that their knowledge, vision, and connections will have an important influence on the student's development in any case.

If these considerations seem overly abstract and New Age, let us consider their consequences for the unfortunate phenomena that I described in the previous section: professors' incentives to narrow their students' thinking, and everyone's incentives to defend the intellectual turf that legitimates their research topics. These "incentives" are illusory, of course, but they are deeply ingrained nonetheless. Where does the problem come from?

You may recall my passing mention of opportunists who do superficial research as an excuse for empire-building. And you may well ask yourself, where is the line here? How do I know whether I am a serious, moral individual, or whether I am a superficial operator? Superficial operators can talk the language of empowerment as well as anyone, and it is very hard to devise an objective test to distinguish the operators from the serious people. The real distinction, down deep, is that a real leader talks to everyone, thinks deeply into the ideas, draws to the surface a real insight about where the ideas are going, and builds consensus around the result, whereas an operator talks to everyone, sees which way the wind is blowing, and hustles to get out in front of it. By networking widely and listening, the operator hopes to get in on the ground floor of something, anything, it doesn't matter what -- surfing on issues, and from issue to the next. The real leader is a dynamic force for an intellectual movement that is genuinely creative, and that keeps being creative in the future. The operator, on the other hand, is actually a follower, a parasite who has learned how to utter the words that make people in an emerging intellectual movement feel good.

If the serious scholars don't do their networking, then a vacuum opens up, and operators will seize the opportunity. That's one more reason why serious scholars should build networks. Even so, the line between serious scholars and operators is not always clear, and as you get involved in intellectual leadership, you will definitely feel the temptation to operate. You will find yourself saying things because they mobilize people and not because you really believe them. And it's hard to tell the difference, given that being socialized into a new profession inevitably means learning a new language. You will probably

sound fake to yourself much of the time, as you learn how to speak this language, and so it's easy to slip into manipulation instead of real leadership. From that kind of manipulation, it is a short step to the sorts of aggressive empire-building that I described above: encouraging others to talk your own language rather than coming up with their own. That is the deepest moral question that you will face as you engage in professional networking, and you might be surprised how quickly you have to face it.

Appendix: Some References on Networking

Here are some general guides to professional networking, without any special reference to electronic mail. Note that the number of new books about professional networking has started accelerating some time in 1994, though I haven't been reading these systematically.

Wayne E. Baker, *Networking Smart: How to Build Relationships for Personal and Organizational Success*, New York: McGraw-Hill, 1994. A fairly comprehensive book on the networking process, with greater emphasis than most on strategy.

Wayne E. Baker, *Achieving Success Through Social Capital: Tapping Hidden Resources in Your Personal and Business Networks*, Wiley, 2000. A new book from Baker that I haven't seen yet.

Donna Fisher and Sandy Vilas, *Power Networking*, Austin: Mountain Harbour, 1992. This is probably the best all-around book on the subject. It abstracts a long list of guidelines that apply just about as much to research people as to the corporate people who are their main audience.

Donna Fisher, *People Power: 12 Power Principles to Enrich Your Business, Career and Personal Networks*, Bard, 1995. Another networking book by Donna Fisher that I haven't read yet.

Ronald L. Krannich and Caryl Rae Krannich, *The New Network Your Way to Job and Career Success*, Manassas Park, VA: Impact Publications, 1993. Another worthwhile networking book, aimed more at job-seekers, with a fair amount of useful concrete advice.

Ann Boe and Betty B. Youngs, *Is Your "Net" Working?: A Complete Guide to Building Contacts and Career Visibility*, New York: Wiley, 1989. Another book in the same spirit, based on stories about mistakes people make in their networking activities. I

find it less useful than the others, but it may well help those who regard themselves as complete beginners.

Jessica Lipnack and Jeffrey Stamps, *The Networking Book: People Connecting With People*, New York: Routledge and Kegan Paul, 1986. This book looked useful when I happened across it in a used book store near the University of New Mexico one day, but I haven't had a chance to evaluate it yet.

Harvey Mackay, *Dig Your Well Before You're Thirsty: The Only Networking Book You'll Ever Need*, New York: Currency/Doubleday, 1997. I haven't read this one either, but I do know that this guy has a quite astonishing gift for networking, or at least a gift for getting celebrities to endorse his books.

Lillian D. Bjorseth, *Breakthrough Networking: Building Relationships That Last*, Duoforce, 1996. Another networking book I haven't read.

Melissa Giovagnoli and Jocelyn Carter-Miller, *Networkding: Building Relationships and Opportunities for Success*, Jossey-Bass, 2000. And another.

Tom Jackson, *Guerrilla Tactics in the New Job Market*, second edition, New York: Bantam, 1991. An inspired book on the networking that's involved in finding a job through the "hidden job market" of hiring referrals.

Thomas J. Stanley, *Networking With the Affluent and Their Advisors*, Homewood, IL: Irwin, 1993. This book is probably the least directly relevant to research people, as should be obvious from its title, but nonetheless it should be a good resource for those wishing to think more deeply about professional networking. Its focus is on the different roles that someone can play as part of a network.

Ford Harding, *Rain Making: The Professional's Guide to Attracting New Clients*, Holbrook, MA: Bob Adams, 1994. Another business book that might be useful in the same indirect way.

Neil Fligstein, Social skill and the theory of fields, *Sociological Theory* 19(2), 2001, pages 105-125. A summary of the place of social skill in sociology. Remarkably, social skill was a neglected topic until recently. This particular theory is largely concerned with the workings of power in a given sector of society. It draws in concepts from several other areas, but its argument is very similar to that of Machiavelli.

Neil Fligstein, Social skill and institutional theory, *American Behavioral Scientist* 40(4), 1997, pages 397-405. An earlier article on the same topic.

Here are some Web-based resources:

Marie desJardins, How to be a good graduate student. An article broadly similar to this one but aimed more at beginning graduate students. It is available on the WorldWide Web at:
<http://www.cs.indiana.edu/HTMLit/how.2b/how.2b.html>

David Chapman, How to do research. A collection of advice for graduate students, including a discussion of the "secret paper passing network".
<http://www.cs.indiana.edu/mit.research.how.to.html>

Heather A. Carlson, Advice for academia. A lengthy Web page of bullets and links. It was originally compiled for a UCSD workshop for women graduate students though most of it is applicable to everyone.
<http://mccammon.ucsd.edu/~hcarlson/Women.htm>

Dale W. Callahan, The PhD process: What it takes to get it done, *IEEE Potentials*, August/September 2001.
<http://www-ece.eng.uab.edu/DCallaha/Pubs/00954531.pdf>

Advice columns from the *Chronicle of Higher Education* are gathered on the Web at:
<http://chronicle.com/jobs/archive/advicearch.htm> You might need a password, which you might be able to get from your department or library.

Symposium: Advisors and the Dissertation Proposal, several articles from the journal *PS: Political Science and Politics* 34(4), 2001. This may require a password or a site license; if so, talk to your librarian.
<http://www.apsanet.org/PS/dec01/toc.cfm>

Hal Varian, How to build an economic model in your spare time. This is a short chapter that tells graduate students in economics how to invent, work through, present, and write up a mathematical model. Although it is aimed specifically to economics students, many of the ideas generalize.
<http://www.sims.berkeley.edu/~hal/Papers/how.pdf>

PhD: First Thoughts to Finished Writing. A how-to from Australia that I haven't read yet.
<http://www2.ems.uq.edu.au/phdweb/phhome.html>

Johan Rooryck and Vincent van Heuven, *Guidelines for Writing Abstracts*. Prepared for linguistics

graduate students preparing abstracts for conferences.
<http://www.leidenuniv.nl/hil/abstr.htm>

Patrick Winston, Some lecturing heuristics. These are the bulleted conclusions from PHW's legendary self-referential lecture about how to give a lecture.
<http://www.cs.dartmouth.edu/~brd/Teaching/Giving-a-talk/phw.html>

Bruce Donald, How to give a talk. Geared more to technical talks organized around overhead transparencies.
<http://www.cs.dartmouth.edu/~brd/Teaching/Giving-a-talk/giving-a-talk.html>

Thomas W. Rishel, The academic job search in mathematics. The basics.
<http://www.ams.org/employment/academic-job-search.html>

Thomas Hull, Michael A. Jones, and Diana M. Thomas, Interviewing for a job in academia, Notices of the American Mathematical Society, November 1998, pages 1353-1357. Emphasizes the questions you should have ready answers to.
<http://www.ams.org/notices/199810/comm-hull.pdf>

Mary Corbin Sies, Academic job interview advice. A professor's advice based on experience.
<http://www.otal.umd.edu/~sies/jobadvice.html> Plus more questions:
<http://www.otal.umd.edu/~sies/jobquess.html>

Trina Sego and Jef I. Richards, PhD interview preparation guide for positions in academia. Emphasis on questions you should ask and not ask.
<http://www.utexas.edu/coc/adv/JR/InterviewPrep.html>

Bonnie A. Nardi, Steve Whittaker, and Heinrich Schwarz, It's not what you know, it's who you know: Work in the information age, First Monday 5(5), 2001. Based on ethnographic studies of employees in high-tech industries, this article argues that the resources that are exchanged within professional networks are increasingly replacing traditional institutions.
http://www.firstmonday.org/issues/issue5_5/nardi/

Adviser, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering, National Academy Press, 1997. So you'll know what good advising is.
<http://www.nap.edu/readingroom/books/mentor/>

The modern project of articulating guidelines for networking originates (more or less) with feminist

authors circa 1980. Their books still hold some interest:

Carol Kleiman, Women's Networks: The Complete Guide to Getting a Better Job, Advancing Your Career, and Feeling Great as a Woman Through Networking, New York: Lippincott and Crowell, 1980. Aimed at women professionals and executives who wish to set up relatively formal networking organizations.

Betty Lehan Harragan, Games Mother Never Taught You: Corporate Gamesmanship for Women, New York: Rawson, 1977. Although not centrally concerned with networking, I mention this book because of its cultural influence as the first hard-hitting how-the-world-really-works book for professional women. Its ideology, which has shaped many feminist discussions of networking since then, reflects both the strengths and weaknesses of the feminism of that era. One of the weaknesses is its inattention to social class; it explains that men learn how the world works through playing football, even though this would predict that working-class men would be as successful in business as their wealthier brothers.

Here are a few references for literature on contemporary patterns of networking:

Howard E. Aldrich and Mary Ann von Glinow, Personal networks and infrastructure development, in David V. Gibson, George Kozmetsky, and Raymond W. Smilor, eds, The Technopolis Phenomenon: Smart Cities, Fast Systems, Global Networks, Lanham, MD: Rowman and Littlefield, 1992. Approaches to rationalizing and managing the networking process through social psychology, network mapping, and systematic development of networks.

Thomas J. Allen, Managing the Flow of Technology: Technology Transfer and the Dissemination of Technological Information within the R&D Organization, Cambridge: MIT Press, 1977. A scary book of experimental and quantitative studies of information flow in groups of research and development people. Many of the results are things that you've always known but that hardly anybody acts as if they really believed, for example that the most productive groups enjoyed a steady flow of ideas from other groups and other disciplines.

Albert-Laszlo Barabasi, Linked: The New Science of Networks, Perseus, 2002.

Pierre Bourdieu, Homo Academicus, translated from the French by Peter Collier, Cambridge: Polity Press, 1988. A difficult and perhaps cynical but nonetheless

very insightful sociological study of the ways in which academics accumulate capital through the symbolic politics of their writings and institutions. Bourdieu himself was a master of the art and should know.

Mark Buchanan, *Nexus: Small Worlds and the Groundbreaking Science of Networks*, Norton, 2002.

Ronald S. Burt, *Structural Holes: The Social Structure of Competition*, Cambridge: Harvard University Press, 1995. This research makes precise the intuition that influence derives from a social network that bridges different worlds. More of Burt's research can be found at <http://gsbwww.uchicago.edu/fac/ronald.burt/research/>.

Diana Crane, *Invisible Colleges: Diffusion of Knowledge in Scientific Communities*, Chicago: University of Chicago Press, 1972. A highly influential study of academic social networks. Because these networks cut across the boundaries of individual colleges, they are called "invisible colleges".

Oscar H. Gandy, Jr., The political economy of communications competence, in Vincent Mosco and Janet Wasko, eds, *The Political Economy of Information*, Madison: University of Wisconsin Press, 1988. An interesting article about the role of communication skills in reproducing social inequalities.

Bernard Michael Gilroy, *Networking in Multinational Enterprises: The Importance of Strategic Alliances*, Columbia: University of South Carolina Press, 1993. The economics behind ongoing changes in the workings of global companies, in which the boundaries of the enterprise are less clear and employees' own networks have increasing economic consequences.

Mark Granovetter, The sociological and economic approaches to labor market analysis: A social structural view, in George Farkas and Paula England, eds, *Industries, Firms, and Jobs: Sociological and Economic Approaches*, New York: Plenum Press, 1988. Presents evidence demonstrating that people get jobs because of who is in their professional networks, and argues that simple economic ideas about supply and demand do not suffice to explain such things.

Kerry Grosser, Human networks in organizational information processing, *Annual Review of Information Science and Technology* 26, 1991, pages 349-402. A survey article about social networks in organizations and their role in passing information around.

Linda M. Harasim, ed, *Global Networks: Computers and International Communication*, Cambridge: MIT Press, 1993. An edited volume in which several of the usual suspects in the Internet world (and related network worlds) offer mostly brief rundowns of their respective projects.

Edward O. Laumann and David Knoke, Policy networks of the organizational state: Collective action in the national energy and health domains, in Robert Perrucci and Harry R. Potter, eds, *Networks of Power: Organizational Actors at the National, Corporate, and Community Levels*, New York: Aldine de Gruyter, 1989. A really interesting empirical study of shifting alliances within networks of people trying to affect policy-making in Washington.

Nan Lin, *Social Capital: A Theory of Social Structure and Action*, London: Cambridge University Press, 2001.

Myrna P. Mandell, ed, *Getting Results Through Collaboration: Networks and Network Structures for Public Policy and Management*, Westport, CT: Quorum, 2001.

Sharon M. McKinnon and William J. Bruns, Jr., *The Information Mosaic*, Boston: Harvard Business School Press, 1992. An interview-based study of how managers get information. One conclusion is that they use a wide variety of sources in a patchwork fashion, and that their queries are largely aimed at verifying or elaborating things they've already observed in some other fashion.

Nitin Nohria and Robert G. Eccles, eds, *Networks and Organizations: Structure, Form, and Action*, Boston: Harvard Business School Press, 1992. A big collection of papers about networks in industry -- mostly in the sense of "social networks", with little reference to computer networks. I find this kind of work to be somewhat sterile in its foundations but occasionally revealing in its observations. Its attention to questions of power is refreshing, up to a point anyway.

Constance Perin, Electronic social fields in bureaucracies, *Communications of the ACM* 34(12), 1991, pages 75-82. Some ideas about the informal networks within organizations that get connected together with electronic mail, often scaring their managers in the process.

Robert P. Singh, *Entrepreneurial Opportunity Recognition Through Social Networks*, New York: Garland, 2000.

Patrick Doreian and Frans N. Stokman, eds, *Evolution of Social Networks*, Amsterdam: Gordon and Breach, 1997.

Lee Sproull and Sara Kiesler, *Connections: New Ways of Working in the Networked Organization*, Cambridge: MIT Press, 1991. A general study of organizational uses of electronic mail.

Duncan J. Watts, *Small Worlds: The Dynamics of Networks Between Order and Randomness*, Princeton University Press, 1999.

Duncan J. Watts, *Six Degrees: The Science of a Connected Age*, Norton, 2003.

Barry Wellman, Janet Salaff, Dimitrina Dimitrova, Laura Garton, Milena Gulia, and Caroline Haythornthwaite, Computer networks as social networks: Collaborative work, telework, and virtual community, *Annual Review of Sociology* 22, 1996, pages 213-238. A survey of research on the role of computer networks in creating and transforming social networks. Many common cybermyths are exploded in a satisfying way.

Here are some comparative studies of networks and networking in various cultures:

Randall Collins, *The Sociology of Philosophies: A Global Theory of Intellectual Change*, Cambridge: Harvard University Press, 1998.

Thomas Gold, Doug Guthrie, and David Wank, eds, *Social Connections in China: Institutions, Culture, and the Changing Nature of Guanxi*, Cambridge: Cambridge University Press, 2002.

Andrew B. Kipnis, *Producing Guanxi: Sentiment, Self, and Subculture in a North China Village*, Durham: Duke University Press, 1997.

Alena Ledeneva, *Russia's Economy of Favours: Blat, Networking, and Informal Exchanges*, Cambridge: Cambridge University Press, 1998.

Yadong Luo, *Guanxi and Business*, Singapore: World Scientific, 2000.

Alejandro Portes, ed, *The Economic Sociology of Immigration: Essays on Networks, Ethnicity, and Entrepreneurship*, New York: Russell Sage Foundation, 1995.

Robert D. Putnam, *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton: Princeton

University Press, 1993. An interesting and influential book about the role of civic life in encouraging both democracy and prosperity. Putnam describes the centuries-old pattern in which northern Italy, where people run their lives by gathering into a wide variety of associations, is generally a happier and healthier place than southern Italy, where people look out for themselves and engage in hierarchical, clientelistic relationships. The basic point applies to the professional world as well.

Annelise Riles, *The Network Inside Out*, Ann Arbor: University of Michigan Press, 2000.

Barry Wellman, ed, *Networks in the Global Village: Life in Contemporary Communities*, Boulder: Westview, 1999. A theoretical introduction to the study of personal social networks, followed by comparative studies in several countries and online.

Y. H. Wong and Thomas K. P. Leung, *Guanxi: Relationship Marketing in a Chinese Context*, New York: International Business Press, 2001.

Yunxiang Yan, *The Flow of Gifts: Reciprocity and Social Networks in a Chinese Village*, Stanford: Stanford University Press, 1996.

Finally, here are several books that might provide general guidance and orientation to graduate students and others in academia. I haven't read most of them, but if you do then please let me know what you think.

Hazard Adams, *The Academic Tribes*, second edition, Urbana: University of Illinois Press, 1988.

Alison Alexander and W. James Potter, eds, *How to Publish Your Communication Research: An Insider's Guide*, Thousand Oaks, CA: Sage, 2001.

Robert R. Alford, *The Craft of Inquiry: Theories, Methods, Evidence*, New York: Oxford University Press, 1998.

Rae Andre and Peter J. Frost, eds, *Researchers Hooked on Teaching: Noted Scholars Discuss the Synergies of Teaching and Research*, Thousand Oaks, CA: Sage, 1997.

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John C. Bean, *Engaging Ideas: The Professor's Guide to Integrating Writing, Critical Thinking, and Active Learning in the Classroom*, San Francisco: Jossey-Bass, 1996.

Tony Becher, *Academic Tribes and Territories: Intellectual Enquiry and the Cultures of Disciplines*, Milton Keynes: Open University Press, 1989.

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Howard S. Becker, *Tricks of the Trade: How to Think about Your Research While You're Doing It*, Chicago: University of Chicago Press, 1998.

Judith Bell, *Doing Your Research Project: A Guide for First-Time Researchers in Education and Social Science*, third edition, Buckingham, UK: Open University Press, 1999.

Thomas Bender, Carl E. Schorske, and William J. Barber, *American Academic Culture in Transformation: Four Disciplines, Fifty Years*, Princeton: Princeton University Press, 1998.

Bennett Berger, ed, *Authors of Their Own Lives: Intellectual Autobiographies by Twenty American Sociologists*, Berkeley: University of California Press, 1990.

Ralph Berry, *The Research Project: How to Write It*, fourth edition, London: Routledge 2000.

James L. Bess, *Collegiality and Bureaucracy in the Modern University: The Influence of Information and Power on Decision-Making Structures*, New York: Teachers College Press, 1988.

Robert T. Blackburn and Janet H. Lawrence, *Faculty At Work: Motivation, Expectation, Satisfaction*, Baltimore: Johns Hopkins University Press, 1995.

Loraine Blaxter, Christina Hughes, and Malcolm Tight, *How to Research*, second edition, Buckingham, UK: Open University Press, 2001.

Robert Boice, *The New Faculty Member: Support and Fostering Professional Development*, San Francisco: Jossey-Bass, 1992.

Robert Boice, *Advice for New Faculty Members: Nihil Nimus*, Boston: Allyn and Bacon, 2000.

Laurence G. Boldt, *How to Find the Work You Love*, New York: Arkana, 1996.

Shannon Bounds and Arthur Karl, *How to Get Your Dream Job Using the Internet*, Scottsdale, AZ: Coriolis, 1996.

Ernest L. Boyer, *Scholarship Reconsidered: Priorities of the Professoriate*, Princeton, NJ: Carnegie Foundation for the Advancement of Teaching, 1990.

David F. Bright and Mary P. Richards, *Academic Deanship: Individual Careers and Institutional Roles*, San Francisco: Jossey-Bass, 2001.

Alan Brinkley, Betty Dessants, Michael Flamm, Cynthia Griggs Fleming, and Eric Rothschild, eds, *The Chicago Handbook for Teachers: A Practical Guide to the College Classroom*, Chicago: University of Chicago Press, 1999.

Alfonso Borrero Cabal, *The University as an Institution Today: Topics for Reflection*, Paris: UNESCO, 1993.

John S. Caputo, Harry C. Hazel, and Colleen McMahon, *Interpersonal Communication: Competency Through Critical Thinking*, Boston: Allyn and Bacon, 1994.

Burton R. Clark, *The Higher Education System: Academic Organization in Cross-National Perspective*, Berkeley: University of California Press, 1983.

Timothy Clark and Nicholas Royle, eds, *The University in Ruins: Essays on the Crisis in the Concept of the Modern University*, Stirling, UK: Oxford Literary Review, 1995.

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Francis M. Cornford, *Microcosmographia Academica: Being a Guide for the Young Academic Politician*, Ares, 1995. Originally published in 1908, and in many editions since.

Larry Cuban, *How Scholars Trumped Teachers: Change Without Reform in University Curriculum, Teaching, and Research, 1890-1990*, New York: Teachers College Press, 1999.

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Beth Luey, *Handbook for Academic Authors*, fourth edition, Cambridge: Cambridge University Press, 2002.

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