

YOU!

What you **MUST** know to start
your career as a professional



Howard R. Moskowitz, Ph.D.

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DEDICATION

After a lifetime of reading, researching, writing, fighting, and occasionally winning, it's time to share some of the wisdom that has come so painfully, and yet joyfully. And with this writing comes the chance to thank three special people.

To the memory of my mother, Mrs. Leah Moskowitz, who instilled in me the discipline to continue working and writing. I did not appreciate her enough during her life. If I could wish anything for a student, I'd wish that the student could spend a year with Mom. The student would be happy, and Mom would get to shape yet another soul.

To my dear wife Arlene, who rejoices in my writing. Such joy makes writing move beyond the act of creation, beyond the expression of skill, elevating it to a spiritual dimension. Without Arlene I could not write with the soul that blesses this work. Simple as that.

And finally to my own teacher, critic, intellectual blowtorch, and late professor, S.S. (Smitty) Stevens. During the eight years that I was privileged to know him and to fear him, I could not bring myself to call him by the name everyone else called him, Smitty. I was only a student then, a frightened student, but ever so ready for education. And now, forty plus years later, it's my time to give to my students and mentorees the wisdom that Smitty gave me. Thank you, Smitty.

One final person deserves thanks. She is Michele Reisner, who, as my coauthor on books and articles, serves as one of the finest examples of one what can achieve through systematic efforts. It is such a pleasure to see her and many others at Moskowitz Jacobs, Inc., develop professionally over the years.

And so they end, the public acknowledgments and dedications. But these public words can scarce convey the real thanks that lives with me. And with these words, reader, I welcome you.

Howard R. Moskowitz, Ph. D.
White Plains, New York
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CUTTING TO THE CHASE: THE BOTTOM LINE

This book describes the formative years of a research professional’s development.. Read it to discover what happens. Read it to learn what YOU MUST do to make this development into YOUR positive experience.The lessons contained herein will launch YOU into a positive, fulfilling, and potentially very remunerative career.

It’s here. Turn the book over and over, and drain the contents dry.Absorb them. You won’t be sorry.

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FOREWARD

The Cultures of Academe or why YOU should know what's in this book

As an introduction to this book dealing with YOU becoming a professional, I will take the liberty of presenting to you what's going on 'behind the scenes' of your education. You can fit this point of view, expose if you will, into the contents of the book you are about to read. In the next few paragraphs of this foreward we explore topics which range across science, society, education, and the marketplace.

Here, in this foreward, and writ larger in this book, is an image of the academic culture and its intellectual expressions. This image encompasses trials, tribulations, successes, and failures of our universities. I write it with optimism, hoping not to expose to the tribulation of a hemlock cocktail. So read on. It's important stuff here throughout.

Two cultures await you; choose one

To put these broad topics within a coherent context I am going to enlarge on a distinction first suggested by the British novelist, C. P. Snow. Snow divided the house of intellect into two domains, which he entitled "two cultures." Of course, these two cultures would have to be populated by different sorts of creatures; here Snow didn't let us down. The creatures were scientists and humanists. Trained as a scientist himself, the line he took in describing them was, of course, quite partisan. These lines generally are. Scientists, Snow suggested, readily understood a great deal of what the humanists were talking about. The humanists, on the other hand understood little or nothing of what the scientists were saying. Does this ring a bell? It should.

So let's visit one of Snow's novels. We find ourselves at a college function. We might hear everyone at high table laugh at a joke that referenced a quote from Hamlet or a character from Joyce. On the other hand one would expect to hear a much smaller response to a quip turning on one of Newton's Laws or some quantum mechanical gag. Not only, Snow asserted, did the humanists not understand the nature of science or the product of the scientific effort, but in their arrogance they demeaned science as mere exploitation of technology.

There was more to it, however. Snow wasn't going to let the opportunity pass without painting a picture of what was going on. Science was a grubby endeavor, not worthy to be compared either in subtlety or power to humane scholarship. In their own fields of literature and criticism, these elites believed mastery could only achieved by those with sensitivity, and the political attitudes that they mostly shared.

To the humanists, science was not a truly intellectual enterprise, and therefore scientists were not intellectuals, but rather idiot savants. It was some magic, some arcane but irrelevant knowledge which let them engage in the mechanical application of rote memory to empty mathematical formulae. The kind of arrogance Snow attributed to the humanists is vividly captured by the response of a famous professor at a major Eastern University which will here go unnamed who, when asked how many scholars he taught, replied, “*Oh, about one in a hundred.*” Feel the bite.

Miffed by the characterization of their enterprise, scientists responded to this put-down with their own Patsy. “*Of course,*” the scientists answer when the humanist attacks them as grubbers after facts, “*that is not our role.*” Indeed, their role, they argue fairly persuasively, is indistinguishable in its creative and analytical demands from the role of the scholar or critic of literature, art, and drama. “The image the humanist has in mind,” the scientist responds, “*is that of the (ugh!) engineer.*” It is the engineer who panders to the demands of the populace. And through his crass exploitation of the scientists’ deep knowledge, it is the engineer supplies the material delights of the public with its penchant for electric beer-can openers and synthetic eye-ball masseurs. Stung by their literary brethren, the scientists redirect that scorn for the material toward the hapless engineers trying do ‘something’, that is ‘something useful’.

The cultures of science – what YOU face and what faces you

The two cultures are really at least three cultures. How is science ‘redeemed’, and indeed why does it need to be redeemed at all? The redemption of science in the eyes of the humanist is made possible by scientists themselves, who graciously, and all-too-often unknowingly kowtow to the humanities

experiment, enjoy.And in so doing you will enrich your souls, your careers, you wallets, and perhaps even yourselves.

Eugene Galanter
Emeritus Professor of Psychology &
Quondam Director of the Psychophysics Laboratory
Columbia University, New York City

BYWAY OF INTRODUCTION

It is the habit of the experienced to share what they know, or think they know, with those who are novices, just starting out in careers.The desire to share one’s wisdom is not limited to the connection between professional and novice.That desire transcends such narrow boundaries, finding its expression in ethical wills by parents for their children, in books about the *rites de passage* that writers so enjoy creating, and indeed in writings about any mentor – student relation.Why should we be any different? We have as much desire to share our knowledge as the mother cow has to give milk. Take away the calf, but the desire still remains.

What is it about knowledge, about experience, about the passage through life that pushes us to share? Why do seasoned professionals suffer from this overwhelming desire to impart the secrets of success to those who, perhaps listening, are caught in a reverie of their own, in the dreams yet unfulfilled? The answer...well there is no answer, because each of us has his own reasons, coming from different backgrounds and experiences, different visions of the future.

Yet, when all is considered, hopefully you will find these words enlightening, a bit inspiring, and in some cases savvier and shrewder, albeit in a positive sense.You may well become educated about the occasional blackness of professional *realpolitik*, the yielding of idealism to practicality in the search for survival.As you read what the words, you will recognize some of your own experiences, perhaps a bit edited, farcified, but your own experiences nevertheless. Enjoy what you read, and when you come upon yourself, stop for a minute and enjoy the rest of the ride with eyes opened up even wider.

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PART I

GETTING EDUCATED

CHAPTER I

THE VALUE OF KNOWLEDGE: WHAT YOU SHOULD LEARN, AND WHY

Introduction

College and graduate school provide wonderful opportunities to get trained in a field. Today you will encounter dozens, perhaps even hundreds of people who are experts in specific subjects. Their resumes are festooned with their specialization in a minute area, in their accomplishments in that area. Garlands of accomplishments drop from the edge of each page, experience, insight, wisdom. The sense from reading these resumes is that the person is an expert, even at the age of 25 or so.

It ain't necessarily so, however. A lot of what you see in resumes is the consequence of training in a specific area, in the ability to do some particular activity well, and the ability to carry out investigations in a tiny, probably irrelevant topic. You may not see evidence of education. And it is to education that we turn first. Education is the foundation of everything. Without it, you might just as well be a quick typist with access to Google®.

What should you learn in college?

College typically represents the first opportunity to get some serious education. There are instances when an individual begins true education in high school, but for the most part one is simply too young. The critical faculties are not yet formed, so even though the person might wish to become educated at the younger age, more than likely the maturity is years away, and what one learns are facts, not truths. There's nothing wrong with the person wanting to be educated and failing to be educated in high school. The mind is not yet ready, not sufficiently seasoned, and not able to appreciate what the person reads, sees, and hears. It's just a matter of readiness.

The value of a liberal education

A recurring theme in this book is the need for education, rather than for training. But what type of education? Many young professionals feel that it's a waste of time to get a classical education, filled or perhaps bejeweled with history, languages, literature. Some even feel that mathematics and science may be too hard, and that it's probably better to get an education in business. One of the most common questions from young students just graduating and beginning their careers in business/science (i.e., product development or market research) is about the value of an MBA. Their question is really about the value of their education, and the possible nirvana that will be theirs if they could only get the magic MBA degree.

So what are we to tell these students and earnest enquirers? What is the real value of liberal education? Is it worth pursuing in these beginning decades of the 21st century, or ought we to relegate the previously hallowed liberal education to the dustbin of history, as something that worked, but in the olden days? Is it sufficient today merely to be facile in finding information rather than absorbing, digesting, and incorporating such information into one's own being?

The reality is that the value of a liberal education is to be found in the second word, education. We don't mean training here, and we don't mean becoming conversant with the newest business practices, the newest science fads, and the latest and greatest in computer technology. We mean by a liberal education the intercourse with the great minds, through reading, thinking, challenging. And we mean the great questions, not the particular minutiae of science and business practice. Aristotle, Aquinas, Dante, Michelangelo, and hundreds, thousands of writers, coped with problems of life, of experience, of art. The student would be best advised to revel in their work, swim in the current of thought, the ocean of ideas. There's time enough later on to specialize, to read the works that will be forgotten in days. A liberal education is the bedrock of a lifetime. This type of foundation is worth spending time creating, laying down, and making sure it's rock solid. A liberal education is truly the basis of future achievements.

What history teaches you

We could talk all day about a liberal education. It's in the specifics, however, that we go somewhere. Otherwise, we're likely to spout platitudes, such as a liberal education makes a person a better citizen. It may or may not, but we have no idea of what a liberal education is from that hogwash, nor do we know what a better citizen is, or perhaps don't even care.

mapping method? What was so attractive? What did the practitioner learn? And, how has this type of thinking affected the development of knowledge on the one hand and business practice on the other. It is these types of questions about 'history' that are important. And, such questions invite the young scientist to do his homework, and by doing so become a better professional, more knowledgeable, more informed, more aware.

Felicitous language – the use of literature

We're surrounded by literature. Just go into any airport bookstore and scan the books. A lot of the books are today's current best sellers. These are books. They're not literature, except by a stretch.

Literature is hard to define, but like pornography it exists and there is some intuitive standard so you can sense what it is when you see it. Perhaps a good rule to follow is go after the 'great books'. The great books aren't named so because they're potboilers. Rather, they deal with enduring topics, with the struggles of people, with situations, with hopes, fears, emotions, and the complexities of life. And they deal with ideas, some with the ideas percolating to the surface, others with the ideas embedded deeply within the story, the description, the evolution of the personas of the people in the book.

And so, you might ask, why bother? The answer is the famous five letter radio station: WIIIFM (what's in it for me?). The simple answer is that you become better from reading literature. Except that that's not the real truth. The more appropriate answer is that literature gives you a sense of other lives, other values. You, and in fact all of us, live within the confine of your own constricted life, paying attention to your own problems, dealing with the most important being in the world, YOU (or speaking from the first person singular, ME, I, MINE, MY and the host of other ways of focusing on that most important of all people). Literature pulls

What about the relevance of this library to the new professional? Today's libraries are locked in mortal combat with knowledge from search. With Google®, scanned papers in JSTOR®, and with the ready availability of knowledge at a single click there's the very real possibility that such wonderful experiences as walking the stacks will become a memory of the past, or even worse, an underappreciated ritual that the new student endures, much as one has to endure other meaningless activities because they harken back to some wonderful past.

To use a metaphor of today, walking through a library is accessing information in a linear way. You actually have to look at the books, have to see other information. Just the act of walking through the library forces you to take in other impressions, other ideas. You may not be particularly cognizant, aware, even conscious of what you're seeing, but the sum of the visual impressions make the difference. Long after you have found the information you're looking for in a journal, tucked away in some stack, amidst dozens of other bound volumes, you'll remember the other articles in that journal. You may not care, and in fact, for most of the articles it's hard to care. But you will get a sense of the article as a small, but integral, part of a bigger whole of knowledge.

Let's finish our walk through the library by comparing that to the way today's researchers all too often find information (the writer included!). Well, we know the topic that we are researching; that's the good thing. We don't need to go to a library; that's maybe good, maybe not so good. We sit in front of the computer, log on to Google or some other search engine, and even Google Scholar®, type in the information. We may be specific in our search in which case we get a few to a few dozen hits. Or we may be more general in our search, and get hundreds, perhaps thousands. Google Scholar® will return to us a lot of other valuable information, such as others who cite the article, and so forth.

Our computer-based search is effective, efficient, and does the job

its worth noting that most scientists work with statistics, work with statisticians, and have at one or another time endured recriminations and hostile reviews based on the statistics in a paper that they may have submitted for publication. So a somewhat longer digression on statistics is probably worth the effort.

Of course each researcher carries around particular biases about statistics. Whether or not we are conversant with the methods, feel comfortable or downright fearful, we carry with us biases about what types of statistics are 'right', what types are simply 'frightening', and what statistics are actually helpful. We also carry around with us an almost instinctive reaction to statisticians, those who practice the often arcane art of statistical analysis. We respond to these individuals in a way that we probably don't respond to anyone else in our lives – a combination of respect, fear, and acute intellectual discomfort. Sort of like responding to a shaman, albeit a research shaman.

We began this section with the statement that statistics divides into two main areas – inferential statistics on the one hand and modeling (or data mining, or other a/courant phrase) on the other. And herein lies some of the problem that you face as a professional. It's one thing to make an observation about nature. You can be careful, you can be an exquisite observer, meticulously detailed, agonizingly exact. (There are a lot of people like that). Then, after you have made the observations it's time to do the 'quant work'. What do we mean by this term 'quant work'? Quite simply it's the rigorous analysis of the data, outside of your hands, done according to specific rules, using numbers to let you make statements about what you have discovered!

Inferential statistics: This is what most people think about when they mention the word statistics. The notion here is a bit unnerving; that the measurements you so carefully made may or may not be statistically significant. But what is this idea of significance really all about? A lot of people incorrectly believe that something that is statistically significant is relevant. That's not the true meaning of 'significant'. Rather

4. The statisticians who you will meet in these two aspects of statistics will differ a great deal from each other. There will be some who love the hygiene, who can help you do the best possible test. And there will be others who will love to help you with the data, those who enjoy mucking around in the results, looking for patterns. Enjoy working with both, but recognizing that they are radically different individuals, with different ways of looking at the world, and with different souls. It's likely that you will resonate with one type more than with another. Which one will make you feel comfortable is an empirical question, to be answered when you do your next experiment.

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CHAPTER 2

THE LURE OF INDUSTRY AND THE CROWN OF ACADEME: SELLING YOUR SOUL OR JUST RENTING IT?

Introduction

It should not come as a surprise that most new researchers, especially those with Ph.D.s, find themselves caught between a rock and a hard place, between the Scylla of science and the Charybdis of paying rent.

For those of you who don't know what a rock and a hard place, its colloquial for the horns of a dilemma, neither choice is good.

For those of you who don't know what Scylla and Charybdis, here is the more eloquent Wikipedia® definition:

The phrase between Scylla and Charybdis, although infrequently used today, has meant having to choose between two unattractive choices, and is the progenitor of the phrase “between a

to have a real job after the Ph.D., rather than becoming a post doc, and perhaps after that a lowly paid instructor. Not that the academic life is to be sneered at, but rather the business life has its own attractions.

The why

It's not which you choose, academia or industry, but rather why others are so damned concerned. What is the reason for people to look askance at someone going into industry? Is it because that person is somehow abandoning a holy cause, giving up vows, exchanging the world of holiness for the world of the secular, perhaps even profane? Is the person choosing the world of applied research, or even management any less of a professional than the person who nobly follows a career of basic research to further the compass of science?

Perhaps some of the reason underlying this notion of 'selling out' is the need for the individual pursuing a scientific career to justify his or her own actions. In fact, years of experience in life will teach that many acts of a person are done in order to protect one's own image of oneself, one's *amour propre*. Protesting that another person will simply 'disappear' when the latter person fails to pursue a pure scientific career says much about the needs of the person doing the saying, rather than about the person receiving the advice. So the practical strategy to deal with the issue of 'choice' is to ask 'why'. What's the reason for the question in the first place? And, always remember: Just the fact that the individual is responding so strongly to your desire for commercial success should tip you off.

Having it both ways – industry and science

You don't need to sacrifice the academic world in order to enjoy the fruits of the business world, the excitement of a life in commerce. Over the past several decades enlightened management in all types of companies have come to realize that many of their professionals want to have some of their cake and eat it, want to do applied work, but at the same time want to publish and maintain a professional reputation

This isn't psycho-babble. We're not talking about 'I'm okay..you're ok', or any of that stuff. We're talking about making room in your future for other people. Keep quiet after you begin talking, and see how quickly the others rush in to help you. Remember that...and remember that the sound of a person's voice is the sweetest melody for that person.

A time to hold (your cards) and a time to fold (your cards) – know when to move on

Ok, so you've begun your career in the company. You've done everything more or less right. The truth of the matter is that you've screwed up a couple of things, but people don't remember because for the most part people don't really care. But not you're getting long of tooth. Perhaps you've been at the company for a few years. You look around, and you feel your scientific growth isn't going anywhere. Now what?

There's no simple answer to holding or folding, staying or leaving. The first thing you should keep in mind is don't leave without a place to go. The second thing is don't leave unless the place you're going to is where you want to stay for a while. Life has a strange way of depositing us in deserts, or stranding us on far away islands, and a variety of places where we are going to be just plain unhappy. And, the story about people you know who somehow find 'wonderful jobs' after leaving your company may just be that – stories, wish fulfillment. The grass may be greener somewhere else ... or it just may be painted hay, that's all.

On the other hand, sometimes you just have to leave. Some companies are toxic. Some companies may never give you a chance to create your own scientific career. Oh, certainly these companies will have wonderful signs on the wall, to the effect that their employees are the most important resource they have, or ideas are critical, or some other nonsense that companies pay

achievements in the realm of knowledge? Or are you going to follow another dream, a different star, and make your way in a company, perhaps compromising your dreams? Just know one thing. In the end we all compromise, academic and business person, scholar and administrator alike. It's not the general path you will take, but the particulars with which YOU feel comfortable. You are not selling out, not really, when you leave academics for industry and commerce. You're simply choosing another world in which to compromise.

There are three paths – which one leads where you want to go?

The truth of the matter is that no author's words can really help you make up your mind. The reality in which you find yourself defies any author 'feel-goods', any vacuous psycho-babble that tells you the decision is up to you. You must really understand yourself first. Try talking to yourself and answering honestly.

The reality of the situation is both far easier and far harder than alluded to here. First, the easy part. The decisions that you make at the very earliest part of your career (1-3 years after the degree) don't really matter in terms of what you write, what you produce. You'll have a chance to do really great work later on. Second, the hard part. The decisions that you make at the very earliest part of your career could matter a great deal, not in substance, but in the choices that will become available. Your decisions will affect the opportunity to make choices later on. These decisions may open up new doors, or close them.

With the gravity and the irrelevance of your actions both in mind, and yes, dealing with the contradiction in your head, let's look at three paths you might take.

Path #1...research is in your heart and mind: When you choose to work for a company, you may not be allowed to do research. If you have research in your heart, if you are filled with the desire to do research, then it's likely that you and the said company will part ways.

CHAPTER 3

THE DANCE OF MENTORING

Introduction

Not all relations between teachers and students are formal, embedded in a particular educational system, with the promise of a degree at the end of the tunnel. Sometimes a student looks for a certain person to become a teacher; the teacher may not even have a formal academic position in the school. Such a student-teacher relation is the essence of mentoring. The relation is not formal, there are no specific demands of performance, there are no grades to be given, and there is no set time for the relation to begin or to end.

Mentoring is an important part of an education, despite the reality that it is informal, often unrecognized, all too frequently unappreciated. Indeed, many students learn more from being mentored by professionals with experience than they may learn in their formal classes, chock-filled as those are with reading assignments, papers to be written and exams.

The secret to mentoring is that the interchange between mentor and mentored deals with aspects that are important to the latter's professional life, at the time that these aspects are taking on reality which they did not have before. And, if truth be told, the mentor may get as much out of the relation as does the mentored. That 'something' is a renewed sense of purpose, and the freshness of spirit which can come only from those starting the journey, filled with hope, not cynicism.

Mentoring versus advising

It's common today to hear the word mentor used, sometimes in school, but far more often in one's early career. It's also common to hear the word adviser. Both are figures of importance for the student and the young professional. These are not the same, however, and even the feelings of the words differ.

The word *adviser* has a formal tone, a sense of giving advice, of giving knowledge in a structured way. When

probably in the laboratory, and in some happy cases at professional meetings. Most aspiring young professionals talk with each other, trying to figure out what's the right thing to do, the right goals to have, the right way to comport oneself.

It is at this inquiring stage that mentoring has its greatest effect. The mentoring relation is a relaxed one, with the mentor clearly taking delight in the mentored and in the developing the relation between the two. It's a chance to inspire a new soul, and in some cases to experience rebirth and redemption. Although one thinks of the mentored as receiving much of the benefit from the relation, the mentor receives a great deal. Rebirth and redemption of one's soul through giving to another is a powerful affirmation of the value of one's life and education. Choosing a mentoree is having a child to mold, a mind to help create, a soul to nourish.

In the end, there's nothing quite like it. Through this unique, intimate guidance the mentored imbibes the soul of the mentor as surely as the mentored learns the ins and outs of the professional. The mentoree is the spiritual and intellectual legacy of the mentor. It is here that the cow gives more freely than the calf can ever take.

The bottom line to all this? Very little in one's professional life can bring so much joy in years to come, long after the mentor has become a colleague and friend. So try it. If you're a student, seek a mentor. Make yourself a mentor, since they are not easily found. And, if you are the senior in the party, open your heart to mentoring. Just try it..and sit back in the knowledge that are in intimate converse with the generations to come, those who will benefit from you through your mentoree.

By the way, it's simple. Just open your heart, and stop thinking of your *amour propre*. *In the world of the noble soul, mentoring surely has a high station.*

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but some 40 years later the confessions spilled the beans. The confessions didn't have to be extracted with anything more than the simple question 'How did YOU feel those days, so long ago?' for poignant memories and stories to burst out, with a powerful suddenness, as if the answerer were reliving the answer in all vividness, there and then.

This feeling of being a 'faker', a 'phony', someone who doesn't belong, appear to be a great deal more widespread than any of us realized. No one who we talked to reported that he or she 'sensed' that this feeling of 'faker' was shared by anyone else. Indeed the 'faker' feeling seemed so shameful that it had to be hidden from the other people, and especially friends and advisory committees. That is, the feeling seemed to be individual, not something shared with others as part of the course.

The feelings of falseness are quite different from the types of competence-feelings engendered in medical schools, dental schools, and law schools, where efforts are made to teach each person that he or she is a professional already, just a few years away from actual recognition, but a professional nonetheless.

And such feelings lead to the next topic, the sense of loneliness.

All alone am I, since I said goodbye, to that comfortable position I had

Actually, the words to the title of this section are from a famous song by Brenda Lee, the short bombshell singer in the early 1960's who mesmerized all of us who were her fans those many years ago. Just a short introduction to Brenda Lee, pulled off UTube in May, 2009:

an ongoing monument, a paper-based stela, to the individual academic. As Wikipedia® explains (*Italics mine*)

The erection of steles was popular in China and consisted of rectangular stone tablets usually inscribed with a funerary, commemorative, or edifying text.the design of steles drifted away from pure Buddhist influence and became wordy displays of script mostly eulogistic or commemorative. They were placed in front of tombs to announce the name of the person buried there, often to provide details of the deceased's life, or were provided to commemorate a particular incident or event and to give details of the purpose of the occasion. Erecting steles at tombs or temples eventually became a widespread social and religious phenomenon.

Summing up

Your early career remains with you. Whether you go immediately into professional research in the university or in business, you begin alone, without a real support network. It's just the way the field you chose happens to work. It's a lonely field. And, as you persist in the field, moving from proving yourself to establishing yourself, you discover ways of coping.

The loneliness remains, however. The business person with a scientific background moves out from the early days of a career by taking on greater and greater responsibility. The cv, the resume reflect that growth by increasingly important jobs, and job titles.

In contrast, the academic measures out his life differently. For most professionals in the academic world the measure is number of achievements, a sort of sedimentation of one's life into layers of limestone, and eventually more impressive layers of marble.

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graduate students is not devastating, but merely a statistic, an unpleasant one to be sure, but a statistic nonetheless. A factoid, like other distressing factoids; terrifying at once, and then laughed at, scars of a wound long healed, of a struggle long over.

But we're talking about loneliness, something profoundly deep, something that manifests itself with subtle ferocity during the days of one's graduate career. We don't hear much of this type of loneliness in business school, in law school, in medical school. We hear, of course, about tough times, brutal competition, indifferent academic executions of budding students, but we don't have loneliness. Not really existential loneliness. These professional schools producing managers, lawyers, doctors, public health servants, architects, teachers, are organized into classes, into cohorts, into squads of individuals who will live together, nourish each other, go through basic training and battle testing together. These individuals in professional schools will maintain life-long friendships because they share a common, almost standardized experience as they mature into the professional. They share because they will remember that they 'went through it together', like recruits in basic training, or in officer's candidate school. No loneliness there. Not really. None of the deep, profound angst of the individual as hero, who journeys along away from the world to prove himself, and then back to the world to tell the story and live out his days.

Must it be so?

When the author was a first year graduate student, having come from Queens College in New York City, this notion of being alone in the quest was at first disquieting, almost dispiriting. The 1960's Queens College, and perhaps many other colleges, instilled a sense of camaraderie in its students. Many of the students were preparing to enter law school, medical school, dental school, and the like. Others were preparing careers in accountancy, and still others were preparing for a life in teaching. These individuals in some way 'knew' what they were going to do.

in the end, it is a question of carving your own path. And that carving the path means that you have to go into the dark woods of Dante, that world where you will discover nature, and discover yourself. In the very end of your days of education you will be judged by the path you take, by your choices, and by your solo accomplishments.

You might be content simply to teach, in which case your education may in effect be equivalent to a professional certification, much as the M.D. degree is the certification that the person can (eventually) practice medicine. We're all familiar with that path; how many of us have heard that 'I did my Ph.D. and that's the last research I did... we just had to do independent research to get the degree'. We're not going to deal with that path, because it doesn't really have much to do with the existential loneliness of the scientists.

Now what about the rest of us, the ones who actually believe that a part, and perhaps even the major part of our future, lies in discovering new things through science? How do we face this existential aloneness? Your research work, your efforts at proving yourself worthy of the degree, and later on the research that you take are part of this existential quest for who you are. The most important thing, however, is that when you become a scientist, at least for a short while you take the hero's journey, out from the known.

In a sense that hero's journey into oneself to prove oneself is the education of the budding scientist and researcher. Not so much the coursework, which fills you with the requisite information that you can regurgitate oh so dutifully in your examinations, organized 'just so', with the proper emphasis on theory and facts. No, that's not your education. That's just the stuff which fills your mind. The real education is that alone time, when you grapple with the unknown, put your mark on it, organize experiments, and take a leap into what is unknown. You come back with the Golden Fleece, or some other treasure, and with a melange of observations and intuitions. And, if you do this correctly, you move on to your career, having demonstrated your prowess to wander into the unknown and come back with the (or some sort of) prize.

Then there was your author, Howard. I had a different world-view from Linda and Herb, despite our all receiving Ph.D.'s in experimental psychology. It was the deeper grounding a few years before in mathematics, when I studied math intensely at Queens College, in New York City.

During the middle and late 1960's I was privileged to study with S.S. (Smitty) Stevens, at the Laboratory of Psychophysics, in Harvard University. We were all psychophysicists, Linda, Herb and myself, so the education that I had in psychophysics isn't what separated our minds, and led to the discussions. It wasn't psychophysics at all. Rather, it was a way of thinking.

According to Smitty, the best research involved the careful search for *relations among variables*. That was appealing to me, perhaps because of the deep grounding in mathematics. There was no need for hypotheses about how the world worked. In Smitty's terms, put as one of the leading quotes of his Handbook of Experimental Psychology (1947), '*theories abound in the absence of fact*'. That phrase about said it all, but of course it would be 40+ years until the reality and perhaps wisdom of that phrase would sink in.

In Smitty's world, knowledge wasn't created by testing the validity or invalidity of a hypothesis, a one-off research event. In Smitty's mind, people began to believe that this is the way the world just might work, and spent all their time proving or disproving certain connections, which were the scientist's hypotheses. In the same vein, Smitty felt that those interested in neural processes were also thinking about the brain and neurophysiology in terms of boxes, and processes. All of these efforts, interesting and making great fun for reading, weren't really science, but rather mythology.

something, and you get a specific result. Over time and experience, we learn the patterns, we understand how nature works, and we adjust the pattern of our behavior to fit with the way nature works. What could be simpler?

And so to think like a psychophysicist, to discern patterns in nature, is nothing more than the formalized way that we learn most relations. We make measured efforts, observe the response from nature, or from another individual, and then put observations together so that a pattern emerges. We may do the act unconsciously, or at least not looking so much for the pattern as for the momentary success, such as not falling off the bike. But, over time, and with practice we learn the pattern, often so well that we can synthesize the pattern in our minds in a so-called *gedanken* or thought experiment. Psychophysics is merely the scientific equivalent, wherein we try to fit formal mathematical expressions to the relation that we are discovering.

If you really want to think like a psychophysicist, it takes just one more step. The step is to pick some 'continuum' that interests you, such as the value of money. Then, you systematically vary the amount of money, and measure the rating of value. Of course you can do many more fancy manipulations, such as taking back money instead of giving money, or saying that you will give the money in six months, or tack on some probability in each case that the money may disappear instead of being given to the subject. And the rating need not be perceived value; it could be happiness, or willingness to work for the money.

As you read the description of the foregoing, you get a sense that the psychophysicist is not 'testing a hypothesis'. There is no factoid to be demonstrated, which shows the mechanism of psychological utility. The researcher simply maps out the relation between money and utility, in whatever way is deemed appropriate. The real knowledge which emerges from the exercise is the nature of the relation. The additional knowledge might

button), or even some non-cognitive response such as heart rate or brain wave action. The measures and thus the result data can then be analyzed graphically to discover a relation between or among variables. Afterwards, the statistically adept can use regression analysis to discover the parameters of the model.

With systematic variation it is quite hard to ‘blow it’, unless you do a sloppy experiment, so that your measurements aren’t precise. However, when you take sufficient care to present the right stimulus to the right person, and collect the rating, you will have done the experiment. Whatever you discover will be a finding!

The next steps are straightforward, and fairly programmatic:

1. When you find no relation between/among the variables, that’s a discovery, as long as you controlled the variables and made the proper measurements.
2. Whatever relation emerges among the variables is also a discovery.
3. Once you have uncovered the relation, you should then demonstrate its reliability by repeating the experiment, to show that you got the same result again.
4. Afterwards, you’re free to show how the relation changes, or does not change, when you introduce external variables into the system. For example, does the relation between sucrose concentration and sweetness change in any particular way in the presence say of a bitter or salty or sour substance? There are a lot of these parametric investigations you can do, to ‘flesh’ out your discovery.

Notice that you are not positing something about how the world works, and then rigorously testing your hypothesis. Rather, you are showing how variables relate to each other. From those quantitative relations you can speculate how the world might work. So, in a sense the act of developing the relation is the real science, and the hypotheses that may emerge are the speculation. Contrast that with the ordinary approach that most scientists use. They posit

PART 2

MEETING OTHERS

CHAPTER 7

WHAT TO DO AT PROFESSIONAL CONFERENCES

Introduction

As you finish your thesis and begin your professional job, you may begin to notice that people like to meet. It's one thing to read papers from people, and perhaps even to correspond with individuals whose work you find important or even just plain interesting. It's quite another thing to meet these individuals face to face, discuss problems, and simply get to know them.

Professional conferences provide a wonderful venue for meeting people, especially when you are a 'newbie', just starting off in the field. There are many different types of conferences where you can meet other professionals. These conferences range from the very largest (i.e., the national meeting each year), down to smaller, more focused ones, and down to the much smaller, invitation-only conferences.

How to choose a conference

When you begin your career, it's likely that no one knows you. You may have encountered some well-known professionals in your graduate student days, but the odds are that such encounters will have been quickly forgotten by the individuals who you met. The reason is really simple, unpleasantly so. You were then a graduate student. Virtually all but the most sensitive professionals forget graduate students. The reason is also really simple. Graduate students are, to most professionals, the babies of the field. And, for the most part no one is interested in babies. The babies simply aren't interesting; they bring very little to the 'professional party'. Why spend precious time thinking about them? In the immortal words of Gertrude Stein '*there's no there there*'.

So which conferences should you choose? If you go to the very large professional conferences such as the Institute of Food Technologists (food) or the American Psychological Association (psychology), you may well be wasting your time and your money. These conferences have thousands of attendees, and as a young scientist or graduate student you're likely to get lost. Oh, you might say that you will gravitate towards your specialty, but it's likely that even that

leaving a trace. A good strategy, which you ought to prepare for ahead of time, would have you identify say 10 individuals who you know about, but who you may not know. For each of those individuals, write down the particular interest of that person, write down 1-2 questions to ask that person, and then 1-2 points of your own to add to the answer. The person may not even attend the conference, but it's not important. What is important is the exercise itself, play-acting, simulating an encounter and a conversation, preparing a question, and then preparing your own 30 second 'elevator pitch' about your own work *as it connects with the expected answer you will receive*. This 'inner game' is far more important than you realize. By becoming a master at the inner game, by interviewing professionals in your field in your mind and preparing your own additions to the answers given, you'll go a long way towards making the most of the conference.

What if you give a paper and a poorly delivered one?

Shake the hand of a graduate student or a young professional at one of these conferences and you will notice something. The person seems nervous, unsure. Despite efforts to appear calm, many young professionals at these meetings are scared, and for good reason. It is at these meetings where one's image is created, at least in part. There are, of course, many other venues and opportunities besides conferences to craft an image, but it's always clearer when you look at someone in your profession and wonder what that person thinks of you, now that you just said something, showed something, presented something.

So now we move to the slightly less pleasant topic, of giving a paper that is not well received. First of all, those of you who are reading, do not despair. And those of you who think you personally have never given a poor paper, don't be so quick to pat yourself on the back.

Giving a poor paper at a

CHAPTER 8

IT'S YOUR TURN: SEDUCING THE AUDIENCE – ARE YOU A MINIMALIST OR A MAXIMALIST?

Introduction

We live in a world of Powerpoint®, and Powerpoint® haters. Many of you reading this book will not remember a life without Powerpoint®, or perhaps its predecessor, Harvard Graphics®. To those of you who live in today, and don't know anything else, we'd like to tell you that although you may hear that it's important to have fancy, sexy, zippy presentations, with a website to match, all up to date, the truth of the matter is that content ends up being king of the hill. And it is content that will occupy most of this chapter, content that you should have, content that you should present, and content that should shape your mind.

What's the goal of a presentation anyway?

When you're asked to present, or when you volunteer (they're quite different), what do you want to accomplish? Sounds like a pretty simple question, doesn't it? Well, ask yourself the question about your last or next presentation. And, without reading further in this chapter, talk out loud, as if you were talking to your mother, significant other, or even better, the snarky, smart 14 year old next door who you've seen develop from a bratty kid to someone with some brains and promise. (Yes Virginia, it happens).

But really, what DO you want to accomplish? Is the presentation a vehicle to show how smart you are, such as what you might present at a conference? At a conference you're ostensibly presenting to share knowledge with your colleagues. More likely, however, and if you're on the youngish side, you're there for a live demonstration of that most important person in the world to you – namely yourself. You never know who is in the audience; your next employer, your spouse-to-be, your professor, or even your mother. So, with that in mind, what do you want to present, and how do you want to present it?

PART 3

PLAYING WITH OTHERS

CHAPTER 10

KEYS TO THE KINGDOM – PRACTICAL STEPS TO A MORAL LIFE

Introduction

The notion of morality is not particularly popular today in the early decades of the 21st century. We don't hear people talking about Cicero of Rome, Lord Acton of England, or about the principles of the Founding Fathers of the United States. We live in an era of moral relativism, where each group of individuals, each country, each civilization is accorded the undeserved privilege of being judged by its own norms. This multi-culturalism naturally spills over to the business world, to the world of the university, and to the world of research. And, how could it not do so? When men make rules, rules don't make men. There are no universals.

Having said that, what if we were to prescribe a moral life for the young researcher or the young employee? What are the words of advice to give the new person on the block, the just-minted Ph.D., the young hopeful starting a job, the slightly older professional working his (or her) way through a corporation and a career? Are there words of wisdom?

The answer is, of course, yes. And the wisdom is old wisdom, not new-age multi-culturalism, relativism, anything-goes, and the like. Indeed, when we've finished describing some of the facets of *'how to be a person'*, you may well think you're reading an ethical treatise. And, perhaps, you are. Perhaps this entire book is merely an updated, particularized version of ethical treatises of days gone by. That wouldn't be so bad either.

Discipline – the first secret of success

Discipline your desires and discipline your actions. Inevitably, you will be successful. It's not the grand vision which will bring success, letting you achieve what you want. It's the daily work, the small things, one atop the other, in

CHAPTER II

KARMA, CHARACTER, AND THE LAW OF ‘WHAT GOES AROUND COMES AROUND’

Introduction

Beyond the topics of your research, and you yourself as a member of a research team, or even, heaven-forbid a non-researcher employee, lies your soul. That's right, your soul. We often think that we will go through life untempted, unscathed and unharmed. To be all those 'uns' is to be unconscious. The reality of our lives is so much different. We may want to do what's right, we may have been raised with strict morality, but life has a way of bending us, bending our paths, and bending, even distorting, our moral compass. And so this chapter, which may not seem particularly appropriate in a book on your entry in professional adulthood, but needs to be written and read nonetheless.

Karma

We begin with the mystical notion of karma, which according to that fount of knowledge, Wikipedia®, is:

Karma (Sanskrit) ...is the concept of “action” or “deed” in Indian religions understood as that which causes the entire cycle of cause and effect (i.e., the cycle called samsāra) originating in ancient India and treated in Hindu, Jain, Sikh and Buddhist philosophies. In these systems, the effects of all deeds are viewed as actively shaping past, present, and future experiences. The results or ‘fruits’ of actions are called karma-phala.

Cutting right to the chase, the word *karma* summarizes it all. The key phrase is ‘the effects of all deeds are viewed as actively shaping past, present, and future experiences’.

Now for the \$6

issues being addressed? Or are they talking about the nature of the profession or the industry? On a more mundane level, are they talking about the people in the company or group? Or talking about others outside the group? Or does the discussion veer away from the problems, the profession, the situation, and on to other outside issues? Are the issues heavy or light, professional, thought provoking, or merely passing the time in pleasantries? And, most important, if you were to describe what's being talked about, say to your mother, what would you say in an unvarnished way? Are you happy with what you hear? Or do you merely tolerate it? Or, perhaps, as is often the case, do you feel that it is strange, a bit alienating, and you don't really feel like you fit in?

This isn't a self-help book about corporate cultures, crazy bosses, in-fighting, looking out for #1, listening with the third ear, or any of the topics which so intrigue readers. Nor is it about scientists in corporations, or about the classic novels of personal development, the so-called *bildungsroman* in German. Rather, it's simpler, more practical. The message is that there is a corporate culture, and that you as a professional scientist or researcher ought to know about that culture because, for better or worse, you're part of it.

Office politics

Along with the culture of an organization is the inevitable politics which emerge. There may be a mythical time in the organization when there was no office politics, when everything was wonderful. Perhaps this mythical time occurred in the early days of the organization, when times were tough, when the vision of one person guided everyone in the quest for survival.

When everyone is fighting to survive in a new organization, somehow that fight brings out the best in people. Everyone appears to cooperate, even those who, in subsequent months, will prove to be the least group-minded and cooperative. New

CHAPTER 13

BECOMING AN AGENT OF CHANGE – REALPOLITIK AND STRATEGIES

Introduction

Today's companies proclaim everywhere they can, that they are agents of change. Their announcements typically have something to do with the fact that the company welcomes evolution and supports movement towards the new and glorious future that awaits all forward-lookers. To back up their announcements, HR (the Human Resources Department) puts up posters in the corporate offices and laboratories welcoming change, announcing that they are at the forefront of welcoming the 'tomorrow' in which we all will certainly live in just a few years. Corporate management is happy with these somewhat bombastic messages. Hopefully, the public rewards the messaging with a more positive view of the company. Its share prices may increase a bit, although share price is more likely to be affected by concrete news rather than by corporate persiflage.

But what is the truth of the matter? Are these corporations really agents of change? When you read about new movements such as *open innovation*, which welcomes ideas and contributions from everyone, can you really believe what you read? Certainly, there are clear corporate actions which can be interpreted as supporting this open innovation, this movement towards the future. But most important – what about YOU in this world of change?

What's good for the corporation is not necessarily good for you, and vice versa

You and the corporation are rather different. The corporation is a giant behemoth or, perhaps, not such a big one but still fairly large. The corporation does not act like a person, despite what you might feel after reading these motivational signs created for the public image and the stock market. The corporation moves ahead by the concerted will of top management and the ability of their employees to execute that will. You, on the other hand, are certainly not a behemoth. You move ahead by a momentary decision to push your life in one direction or another. And, you and the corporation experience

be feared after knowing your data, than to be happy after knowing your data. You want to change the world. The world doesn't get changed by happy campers. The world gets changed by hungry, somewhat (but not too) fearful people, by the hungry Cassius, with a look of hope, and a look of ambition. Seek these when you present your results; make your presentation simple and cogent. And, who knows, you may be well on your way!

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CHAPTER 14

BOO HOO – MY BOSS (PROFESSOR, COLLEAGUE, POST-DOC) DOESN'T LIKE ME

Introduction – so what else is new, let's go for lunch

Let's see, now. First, you're in elementary school or even kindergarten. Your teacher watches carefully for any sociopathic behavior, such as one child mercilessly hitting another. By the time you've finished kindergarten and elementary school, you pretty well know that some people are nice, others are just plain rotten and, of course, you're more towards the side of nice. High school is more of the same, only more subtle. Instead of outward displays of hostility, you'll encounter structured hostility, disguised as simple 'feedback' or 'comments' on yourself, but administered with the deftness of a surgeon's practiced hand.

And, of course, by the time you get through college and graduate school, you'll have recognized the world for what it is – a true incarnation of the blooming, buzzing confusion of William James, with the black tonality of Hobbes' life of man – nasty, brutish and short.

CHAPTER 15

PLAYING TOGETHER VERSUS COMPETING: A STORY OF TWO CORPORATE FUNCTIONS

Introduction

Once you have finished your training and begin your career, it's important to learn how to work with your colleagues, those who support you, both inside and outside the corporation. No professional employee is an island unto himself anymore. All people in companies are members of an ecology. No, it doesn't sound particularly romantic or professional, but the truth of the matter is that we cannot do everything ourselves. We depend vitally on others to get what we need done.

But what's the practical lesson here? All of us, more or less, know that we rely on others. Few of us could create our own computer, or write our own Windows® operating system from scratch. We know when it's in our interest to 'make something' from scratch versus when we should buy it 'off the shelf'. It's obvious for equipment, computer programs (unless one's ego is tied up in the program), for building services, and so forth.

However, it's not so obvious when the 'make versus buy' decision comes to professional services, where many of us are employed. With this lack of clarity in mind, let's investigate one specific area of a business, consumer-based evaluations of products, to see what type of life lessons we can learn.

The goal of this chapter is that you understand how the two groups do their jobs, how the individuals in both groups interact with external resources, and where each of these groups has 'gone' in terms of corporate position. You'll start to get a sense of the different behaviors in a corporation, and what might be the ultimate impact on your career.

The reason for choosing these two specific groups or functions is simply because I am intimately familiar with each. But, the truth is, that's not all. Each group possesses its own heritage, follows its own practices, and attracts different types of people. Understand how these two groups differ and you will understand the nature of

