

Putting Your Science to Work: Practical Career Strategies for Scientists

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APS

**By
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About the author...

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Introduction

There is a tendency on the part of faculty to want to clone themselves and, by their attitude, to make students feel that "success" means a career in research at a university or at one of the few large industrial laboratories that are left. This tendency is misguided, for most jobs for our graduates have always been in industry and not in research. One of the reasons society supports us is to train people who will transform the work done at universities into something of more direct benefit to society.

*Burton Richter, 1995
Past President, APS*

The low demand for Ph.D.s is not a temporary reflection of the business cycle, but a sign of a long-term shift in how the nation uses researchers. America will always need excellent, well-trained scientists, though not necessarily Ph.D.s, and not necessarily for traditional academic research and teaching. To pretend otherwise is not only wasteful but dangerous: if a real scientist shortage hits, no one will believe it.

Sharon Begley (Newsweek, December 5, 1994)

The purpose of this workshop is to assist you in conceptualizing, exploring and finding a satisfying career. It is not about abandoning research. Rather, it is an exhortation to explore a wide range of possible careers - and to apply the many skills you developed as a scholar to a myriad of problems in and outside of academia. It is also an introduction to the job search process with a particular emphasis on those aspects most crucial for Ph.D.-trained scholars.

Exploring alternative careers can be a liberating, empowering and fun experience. Who knows? Maybe the process of exploration will confirm your original choice. No matter what the outcome, you will be better off for the experience -- both in terms of your own direction and for the advice you may give to your students in the future.

Only **you** can be in control of your career and nobody cares more than **you** about your future.

Now the Good News...

Young people themselves don't realize how valuable they are with a Ph.D. It means an ability to think deeply, solve problems, analyze data, criticize and be criticized. [Ph.D.s] often don't realize the breadth of what they are capable of doing.

Neal Lane (Director, National Science Foundation)

Ph.D.-trained scholars possess many of the traits and skills that are of highest value in the "real world"

Transferable skills

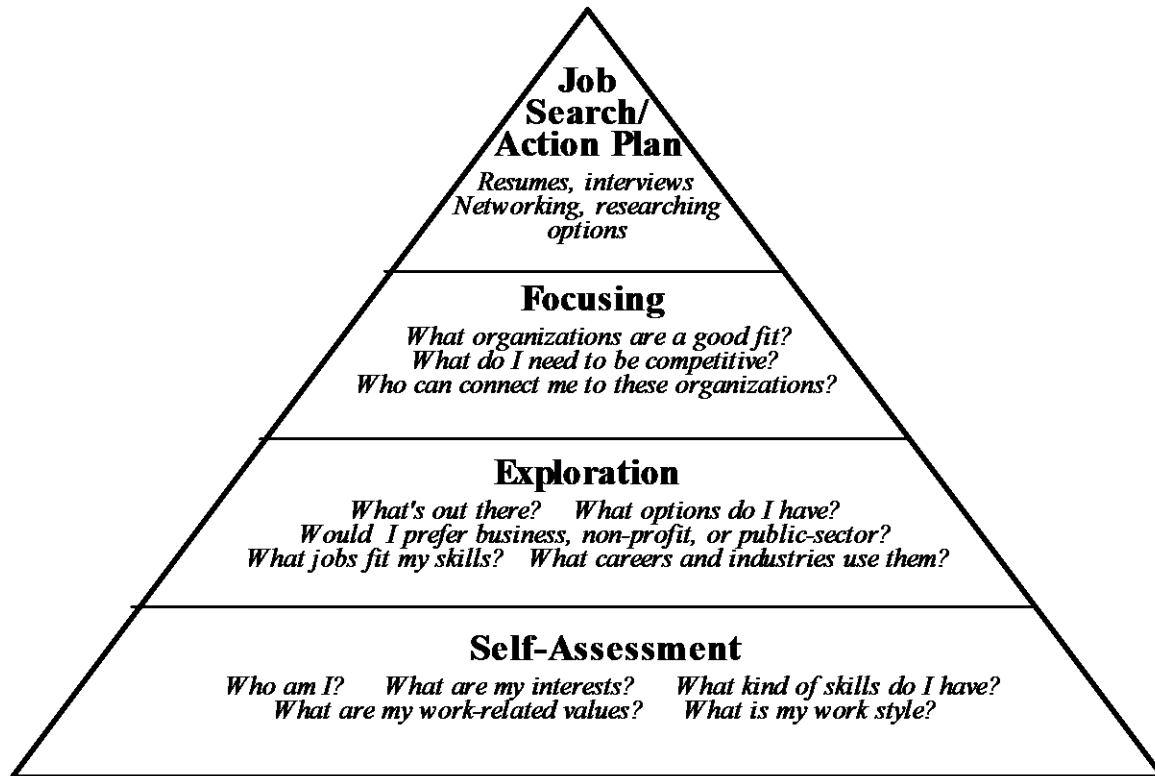
ability to function in a variety of environments and roles
teaching skills: conceptualizing, explaining
counseling, interview skills
public speaking experience
ability to support a position or viewpoint with argumentation and logic
ability to conceive and design complex studies and projects
ability to implement and manage all phases of complex research projects and to follow them through to completion
knowledge of the scientific method to organize and test ideas
ability to organize and analyze data, to understand statistics and to generalize from data
ability to combine, integrate information from disparate sources
ability to evaluate critically
ability to investigate, using many different research methodologies
ability to problem-solve
ability to work with the committee process
ability to do advocacy work
ability to acknowledge many differing views of reality
ability to suspend judgment, to work with ambiguity
ability to make the best use of "informed hunches"

Personal Qualities

intelligence, ability to learn quickly
ability to make good decisions quickly
analytical, inquiring, logical-mindedness
ability to work well under pressure and willingness to work hard
competitiveness, enjoyment of challenge
ability to apply oneself to a variety of tasks simultaneously
thorough, organized and efficient
good time management skills
resourceful, determined and persistent
imaginative, creative
cooperative and helpful
objective and flexible
good listening skills
sensitive to different perspectives
ability to make other people "feel interesting"

These are the HOTTEST and MOST VALUABLE skills in the workplace

The Career Planning Process: How do I start?



It would be nice if one proceeded up this pyramid in a logical and orderly fashion but it seldom works out that way. We encounter a number a barriers, both real and perceived, which prevent us from recognizing all of our career options. Ph.D.s tend to skip the bottom two steps and proceed directly to a search for specific jobs in specific companies.

Self Assessment: Who am I?

Informal methods of self-assessment include:

- Initial Brainstorming
 - What Values, Interest and Skills are important?
 - What careers utilize them?
 - What specific organizations do you admire and why?
 - Where is your PASSION!!!
 - Start a Career Development Journal!*
- Try some self-guided interest and skills exercises (see following pages)
 - List accomplishments and identify skills that you have used.
 - Check off a skills list.
 - Describe an "Ideal Day" on the job.
 - Identify and consider the implications of choosing "Five Lives."

Formal methods of self-assessment include:

(These are usually done with the assistance of a career counselor)

- *Strong Interest Inventory* -- compares your interests to people successfully employed in a variety of occupations and groups occupations by six interest themes.
- *Myers-Briggs Type Indicator* -- identifies 16 different personality types which can be compared to different types of work environments.
- Skills and values card sorts.

Career interest tests have their proponents and their detractors

America is a society of test-takers. Every year, hundreds of thousands of people take psychological tests to understand more about their careers and job potential.

*People often don't know how to think about their careers, or they felt like they've hit a brick wall. We use tests to break the brick walls down to building blocks.
(Frederick Eigenbrod, clinical psychologist, Right Associates)*

Critics say that there are no good shortcuts to self-understanding. Tests give a vision of an individual based on the assumptions of the test designer, sometimes reinforce societal stereotypes and should be viewed with caution.

*excerpted from "Job hunters must use their heads in weighing personality test scores"
by Michelle Levander, San Jose Mercury News*

Interest inventory exercises (Some homework for after the workshop)

Below are a series of self-assessment exercises, modified from *Beyond the Ivory Tower* by Margaret Newhouse. These exercises may seem nebulous and somewhat redundant, in fact they are. But they can sneak up on you and help to reveal things about yourself. Your answers to these questions will vary from day to day, depending on immediate as well as long-term concerns. But in the end, returning to these questions from time to time can help guide you to specific parts of your life that you find the most fulfilling.

1. Make a two-column list of everything you can think of that you like and dislike about the academic career, and then assign priorities. What do you learn about your values, interests and skills as they affect the work and workplace?
2. If you could live five lives *simultaneously*, and explore a different talent, interest, or lifestyle in each, what would you be in each of them?
3. Think back over the experiences you have had in your life - in the areas of work, leisure, or learning - and pick three to ten that have the following characteristics:
 - a. you were the chief or a significant player
 - b. YOU - (± the world or significant others) - regard it as a success: you achieved, did, or created something with concrete results, or acted to solve a problem, or gave something of yourself that you are proud of and are pleased by
 - c. you truly enjoyed yourself in the process.

List each of them, write why you consider it a success, and write a paragraph or two detailing the experience, step by step. Extract from these stories the values and interests they reveal about you and the skills you used. In other words, what do they reveal about what you like to do and do well? This exercise works well if you also tell your stories to one or two friends and ask them to reflect back to you the skills, qualities and values they perceive.

(This is a good exercise from which to construct good interview answers and resumes. Many of the interview questions listed in Knock 'em Dead could be answered with the results of this exercise.)

4. Make a two column list of "characteristics any job I take *must* have" and "characteristics it *must not* have". This list will be very preliminary, and you will constantly revise it throughout this process and beyond. But making the list will help you summarize your knowledge to date and keep you focused on your central values and requirements. It can also keep you from compromising on essential things when you get a job offer.

Steps to Conducting Career Planning Research

If you have gone through some sincere self-assessment you may have some general ideas about what you might enjoy doing. The difficulty arises in trying to find out exactly what professions, fields and jobs call upon the skills and interests that you possess. This is the time for some sincere RESEARCH. This type of data gathering involves looking around, reading and asking questions. Here are some suggestions:

- Identify three general career fields that you want to research (one can be your current path, for example, teaching/research) that are good matches to your interests skills and values.
- Read about the field or employers in that field (university and community college career centers, business libraries, and community career centers have this information).
- Read books such as *The High Tech Career Book* by Betsy Collard or *Choosing a Career in Business* by Stephen Stumpf.

Informational Interviewing

*Going directly to places where you would like to work is six times
as effective as mailing out résumés and cover letters*

Bolles- What Color is Your Parachute

The purpose of informational interviewing is to obtain first-hand, current information about a career field. It is about doing research and learning something, not getting a job offer. There are several benefits of getting experience in this type of interview situation. After all:

- you are in control
- you can ask sticky questions that wouldn't be appropriate in a job interview
- you can see people in their actual work environment
- you can get feedback and advice
- you can make sure the work environment is right for you
- you can gain visibility
- you can practice being perfect for when it really counts

In order to make informational interviewing a success you must be well-informed, focused and BRIEF. Wasting people's time is just about the best way to ensure that they will never help you again.

Arranging for informational interviews requires a little leg-work. Start by finding some referral, either a person, or a school alumnus/ae connection. Start by looking at the career planning and placement center you are using: find out if there are individuals who have agreed to be interviewed (alums commonly do). Once you get the first name, that person can give you advice about who else to talk to. Then ...

contact the person by phone or letter, explain that you want to learn more about the career field and that you got their name by _____. They may refuse or say that another person would be more appropriate. If so, contact that person and move forward.

prepare some of your questions in advance - don't waste time: a typical informational interview is only 20 minutes. People do not enjoy answering questions that could or should have been investigated elsewhere

questions asked usually pertain to:

1. Required background and training
2. Specific information regarding the career
3. Personal experiences
4. Advice
5. Future trends

Some do's and don'ts about Informational Interviewing

1. Treat it as a formal interview for a job:
 - do your homework
 - think carefully about what you want to learn
 - prepare questions
 - act professionally
2. However and informational interview is **not** an interview for a job- do not:
 - ask for a job, even indirectly (make this clear from outset)
 - speak only with one or two people and assume they represent all

Your assignment: Set up an informational interview with someone you know (a friend). This trial run will help you work the bugs out and will make you more comfortable with the whole process.

Networking: How most of the people on planet Earth got their jobs

It is a job-hunting cliché: Networking is the most effective way of finding a job. Period. But it is surprising how little Ph.D. scholars pay attention to this naked fact. Networking is the process of meeting people and

1. Learning about careers and specific job opportunities from them and
2. Alerting them to your career goals and abilities

Networking enormously increases your chances of landing a good job and having better job mobility.

Networking shouldn't be confused with Informational Interviewing. The latter is a formalized way of obtaining specific information from a specific person. Networking is more informal. At it's simplest, networking is simply alerting people to the fact that you're in the market for a job. Networking can also be a source of support and encouragement, after all, isn't it nice to think that other people have their ears to the ground for you?

Who is my network?

Here are a few specific suggestions:

- Friends from high school, college, grad school
- Relatives
- Past bosses (e.g. summer employment jobs)
- Neighbors
- Mentors
- People you meet at Seminars, Conferences and Workshops
- Other people looking for jobs
- and who they know...

In other words, ANYBODY you are friends with and who you feel comfortable talking to.

How do I network?

You can be as formal or informal as you like, though keeping track of tips and sources by keeping notes is a good idea. Some people recommend that you make lists and engage in formal contacts. I think that meeting people and being low-key is easier to do. Very few people enjoy a pushy aggressive person asking for "help."

- TALK TO PEOPLE IN YOUR CAREER FIELDS OF INTEREST (alumni/ae, family friends, etc.)
 - Start with one person that you already know or have some connection with.
 - Commit to contacting him or her in the next few weeks for an informal meeting, this will serve as a means to "practice" informational interviewing.
 - With the next contact(s), send them a letter introducing yourself and follow-up with a phone call to set up the meeting.
 - Make sure you get permission to use their name as a reference

Focusing: Targeting specific fields

This is probably the hardest level of the whole pyramid. Up to now things have been relatively easy, even fun. This stage is where the psychological barriers are encountered. It is also the stage of commitment; you really are going to look for a job.

Difficult questions that have been deferred up to now begin to appear.

Common Career Change Questions Asked by Ph.D.s:

- "Will this change be any better than sticking it out in science?"
- "Am I taking a big risk?"
- "Will I have a problem getting a new job?"
- "Will my family, friends, advisors think that I have failed if I change directions?"
- "Will I think that I have failed if I leave science?"
- "Will I have to go through this period of transition again at a later point in my career?"

These are hard questions, especially for people who feel like they have trained all their life for one career. Especially for those who really love doing science. However there is a world of possibilities out there for brilliant, articulate, independent people like yourself. Just remember the following:

"LAWS OF THE JOB SEARCH"

by David Maister, Ph.D.

1. Ban the word "should" from your job search.
2. If your work doesn't turn you on, you won't be very good at it.
3. Changing jobs is easier than changing families, and a lot less painful.
4. The more confusion you feel, the worse the decision you'll make.
5. Remember, the point in life is to be happy. All other goals (money, fame, status, responsibility, achievement) are merely ways of making you happy, and worthless in themselves.

Information on a career field you know: Research Science

A Ph.D. is not enough! - A Guide to Survival in Science by Peter J. Feibelman Ph.D.

Peter Feibelman's book, A Ph.D. is NOT Enough should be required reading for every Ph.D. student entering graduate school. A senior scientist at Sandia National Laboratory, Feibelman's book is a concise and witty survival guide for young scientists who aspire to a career in research. Much of Feibelman's advice is common sense. Its value comes from the fact that it is all presented in one place. Sort of like a scientist's facts-of-life book.

Feibelman discusses all aspects of a young scientist's career from choosing a good advisor and a good thesis to obtaining a post-doc that will forward your career and so on. Feibelman also gives some practical advice on the mechanics of getting hired: how to present an outstanding job talk, writing notable research papers and defining an attractive and tractable research program. The advice in this book is not only applicable to all scientists and engineers but to anyone who is seeking a career that will be predominantly self-guided and high profile.

There is one piece of advice that is repeated and elaborated on throughout this book: get a mentor. Feibelman discusses how interacting with more senior research "aunts and uncles" can give a young scientist a broader perspective as well as access to the inner working of the scientific process. This person needs to be someone else besides your Ph.D. advisor, especially a person who will take personal interest in you and your progress. This piece of advice is so important and so valuable that it cannot be overstated. Many have said that the paucity of mentors or "role models" for women and minorities in science is the principal reason that they continue to be so poorly represented.

I summarize some of Feibelman's best advice below:

Choosing the right advisor and thesis

- choose an established advisor with a track record of success
 - they are more able to support you
 - they won't be competing with you once you finish
- choose a research group that is active, collaborative and interdisciplinary
 - do the advisor and the members of the research group see the "big picture"

Choosing the right post-doc

- choose a project and group that will enable you to finish up and publish research in time
- choose a senior scientist with an established lab
- don't be a slave

Giving talks

- never overestimate your audience
 - some basics are good - the audience feels like they know something
- make it clear what the big picture is
- make yourself heard, don't talk fast
- cut the filler (outline slides, detailed experimental set-up)
- make your overheads readable and not ostentatious

Publishing papers

- plan your research as a series of short complete projects
 - easier to write
 - keeps your name in circulation
- write compelling papers (read the book for some very detailed advice here)
- don't be afraid to use first person/avoid overuse of third person
- send it to a colleague for review first

Choosing a career path

- weigh the relative value of prestige money and security
- weigh the desire of teaching with the desire of research
- weigh the relative value of an academic setting with others

Job interviews

- do your homework - find out the issues and desires of the employers
- think of answers to obvious questions in advance e.g.:
 - "What will you do here if we hire you?"
- practice your %^\$#! talk, practice again, and again

Getting funded

- start writing grants in grad school
- address important issues, not just topics in your sub-discipline
- do not promise the moon
- get involved with a group effort

Establishing a research program

- be a problem- rather than a technique-oriented thinker
- plan a series of short projects that drive toward a bigger goal
- ambition is rewarded

Why didn't our advisors tell us all this? Part of the reason may be because they themselves have never really thought about it. Part of the reason may be in the nature of the Ph.D. training for scientists. Many adhere to the philosophy that survival instincts in science can't be taught and that only those with the instinctive skills should survive. This is an obvious crock. Most often, those students who seem to be "on-the-ball" have only had the fortune of receiving this advice earlier, either from a professor, more senior graduate students, or from a family member. Survival skills in science can and should be taught! I hope that those of you who end up advising other students will keep this in mind and either sit your students down for a talk about the "facts of life" or simply buy this book and make it assigned reading!

Resumes and Curricula Vitae

Typically, people begin the process of searching for a job by constructing a resume or curriculum vitae (or CV). Most of you probably have at least one or the other. Some of you may have even consulted a book or two about writing resumes. However, most of you may have received no formal advice, and are proceeding based on the examples of friends or family.

The rules of CV construction may be familiar to some of you, since we come from a work environment where that document is the norm. Most Ph.D.s, however, do not have any experience writing a resume and wind up creating a document that looks very much like, well..., a CV. Even though we live in a free society there *are* some fundamental differences between CVs and resumes. However, despite these differences, the goal is the same:

The main purpose of a resume or a CV is to get you an interview.

The CV is a summary of all your educational and professional background. It is used when applying for academic jobs (in teaching or administration), for research jobs in government or private laboratories, or for a fellowship or grant. A CV commonly includes a full list of publications and can be several pages in length. Space is not at a premium. The CV will be thoroughly examined by at least one member of the search committee who will glean the information that is of highest importance to the committee.

The resume is a summary of those aspects of your job experience and education that qualify you for the particular job to which you are applying. Resumes are used everywhere a CV is not specifically requested. A resume is shorter, usually 1 page, sometimes 2 for higher-level positions. Space is at a premium, and the layout is compact but easily readable. The *average* employer spends about 20 seconds examining and sorting each resume. Thus the challenge is to provide the right information in an attractive layout that will cause the employer to place your resume in the "for closer examination" pile rather than the "maybe later" pile. Resumes from research-trained scholars applying to positions that do not call for an advanced degree may elicit additional scrutiny if, for no other reason, because such a resume would be uncommon. Whether or not this ends up working for you or against you depends very much on the skills you offer *and* the professional nature of your job materials. The biggest challenge for scholars applying to non-academic jobs is convincing employers in the first 20 seconds that you are serious, competent, and prepared. Your resume, like your cover letter, your interview, and every other part of your package of job materials, must reinforce the preconception that you are bloody brilliant but must also immediately challenge stereotypical notions that you are a loner, are impractical, and are uninterested in things besides science.

If you have read everything up to now you may realize that it is critical to undertake some sincere self-assessment before trying to construct materials that you will send out to strangers. Self-assessment is particularly important if you are exploring alternatives to research science. After all, a resume should say at least as much about *where you are going* as it does where you have been.

In the past, people have discussed converting a CV to a resume as if all that mattered was having a single page and the right font. No way. Depending on how far you are moving away from a career in research science your resume will bear less and less resemblance to your CV. Your technical and research experience will be a major item or series of items in your resume, but you will likely include other things as well, such as relevant skills and experience from the rest of your life. And, yes, even for the most die-hard among you, you *do* have other parts of your life besides science.

Constructing a CV

The overall layout of your CV is NOT going to make much of a difference in whether or not you make the short list. However, presenting a CV that is organized, attractive, easy to read, and contains all the information of interest to the search committee will help them evaluate you. Making their life easier can't hurt, now can it? CVs that are missing critical information, are poorly laid out, or are hard to read can only hurt your chances.

The contents of your CV may vary somewhat, depending on your field. If you have not already done so, check out your advisor's CV, or the CV of a collaborator to see what categories of information are included. Some categories of information are essential in all fields. These are:

Identifying information

Usually your name, address, phone/fax number, and e-mail address come first. Be sure to include your citizenship AND make sure your name appears on each page (either in the header or footer of the CV). Do not include your date of birth, marital status, number of children, social security number, or other personal information. Not only is it not required, but it is illegal for employers to request this information of you (more on that in the resume section).

Education

List your degrees, along with the department, institution and dates of completion (or expected date). In each, list minors, sub-fields and any academic honors such as Summa Cum Laude. Some people list the titles of their theses and the name of their advisor as well, others have a separate section for this.

Dissertation or thesis

Some people have a separate section giving the title and a brief (one paragraph) description of their work. Some disciplines of science simply list the title and describe the research more fully in the Experience section

Awards, honors, fellowships, scholarships

All honors and awards outside of academic honors should be listed in this section. Honors such as membership in Phi Beta Kappa, outstanding paper awards, and competitive fellowships and scholarships should be listed, along with the year of the award.

Professional experience

This section should be used to describe all your past positions and experience. Some people structure this chronologically, giving the position, such as Research Assistant, along with

the institution, the date (usually month/year), and a brief description of the activities involved. It is important to list more than only job titles. Explain what you did in each position. Don't assume that those reading your CV will know exactly what went into your year as a TA. Be specific, be brief, and quantify your accomplishments as much as possible. Some people break this section up into subheadings such as Research Experience, Teaching Experience, Consulting, and others. If you do opt for this, make sure that the information is still easy to find.

Publications

This section is usually at the end of every CV, usually because it alone takes up a few pages. While citation styles may vary from field to field there are some general things that you should bear in mind.

1. It is a good idea to sort out your publication list into sub-categories of importance. Peer-reviewed full publications are by far the most important part of your publication list and should be listed first. Publications in press or in review should be listed separately. Conference proceedings, reports, and other publications that are not peer-reviewed should be listed next. Other publications, such as published photographs, or patents can be listed in their own categories next. Abstracts are the least important, and should be listed in their own section at the end. Some people only list the last few years' abstracts to save space. For scholars with several pages of peer-reviewed papers in print, the list of full publications itself can be sorted. For example, the publications of a Crystallographer might be sorted into fields of Solid-State Physics, Materials Science, Ceramics, and General/Interdisciplinary. Any format that helps people assess the quality and breadth of your publication record is an asset.

In contrast, layouts and citation styles that tend to obscure the quality and breadth of your publication record should be avoided. Mixing citations for abstracts and full papers together only forces people to hunt through the list and find the few items that are full publications. Citations that obscure the order of authorship or leave out some information only waste time. In some cases, these styles can leave the impression that the applicant is trying to camouflage an inferior publication record. Despite what you may think, duplicity is NOT a valued trait in academia.

References

List the people who have agreed to write letters of reference on your behalf. Because your list may be used to contact these people for further information it is important to list not only the name of the person but also their job, title, their relation to you (e.g. Ph.D. committee), their full address, their phone number, and any other appropriate means of contacting them. Be sure the people you have listed KNOW they are acting as references.

Letters of reference are a VERY important factor in hiring decisions in research science. Letters of reference are seldom overtly negative, and tend to range from luke-warm to totally enthusiastic. Letters from well-known researchers in top-notch departments are taken more seriously than those from lesser-knowns (big surprise, right?). Clearly, a good letter from someone who knows the department or group to which you are applying will be extremely valuable because the recommender can be specific about how you might fit in to the organization. The strongest letters usually say things like:

"Sandra is an outstanding researcher, in the top 3-5% of the graduates from our institution over the last ten years. She has drive, creativity and the ability to become a leading research astronomer, even in this tough market."

In contrast, a less enthusiastic letter might read:

"Sandra has shown dedication and drive throughout her years as a graduate student. She has the capacity for continued productivity in the field of astronomy."

You be the judge.

Letters of recommendation are confidential. However this does *not* mean that you cannot discuss their contents with the writer ahead of time. Advisors and other letter writers often know few details about the openings and fellowships for which you are competing. It is important to let them know any specific issues or qualities that are important. It is also perfectly appropriate to suggest they discuss some topics that you feel might have particular bearing on the selection process.

Other sections

Academic/Professional Service

Some people have worked on committees, volunteered in educational projects, or served their school or organization in other ways. This is useful information, especially when applying for jobs that will value this type of service.

Memberships or Professional Affiliations

Many people list all the professional and scientific societies to which they are active members, along with the date at which they joined.

Grants and Funding

For some jobs, getting grants is not just laudable; it's essential. People with experience raising their own funding sometimes list their past and current grants in a section of their CV. Usually the title, agency, amount, and dates of the funding are listed.

Courses Taught

Some people list the course titles that they have taught. Other people list them in their Teaching Statement.

Students Advised

Some people who have experience advising students (usually in research projects) list the names of their past advisees.

Languages

Some people list the languages in which they are fluent.

Teaching and Research Statements

While the CV is the instrument from which an initial ranking is usually made, statements of teaching and research interests are an important part of academic applications. These are usually one to two pages in length and describe not only your past teaching and research experience but your future goals and ideas. Think of it as a proposal for your next few years of employment. See Guy Smith's description of the academic job hunt (page ___) for more insight.

Cover letter

As with resumes, cover letters that accompany your CV should be tailored to the job to which you are applying. A cover letter should:

- state the specific position to which you are applying
- explain how you learned about the opening
- accent your most important qualifications

The cover letter should accent those skills and experiences that are of greatest relevance to the job. If you are applying to a small liberal arts college you may want to emphasize your experience teaching and advising undergraduates. If you are applying to a major research university you may want to point out that you currently have \$330,000 in research funding from NASA. Because of the regimented process for filling most academic and research job openings it is usually not necessary to suggest a specific course of action (this is somewhat different in the case of resumes as you'll see later) such as "I will call you in two weeks to ..." As Guy Smith suggests, you may simply want to run out to the drug store and get a package of Tagamet.

Resumes

There are two general types of resumes: chronological resumes and functional, or skills resumes. Chronological resumes are the things you are probably most familiar with: they list your work experience in chronological order. Functional resumes categorize your experience under several key skills areas: the skills needed for the job you have targeted. Chronological resumes are useful for demonstrating a pattern of working, especially if you are continuing in a general profession or field. They emphasize progression and a steady history of work. Skills resumes are structured to emphasize marketable skills. They tend to be more effective for people switching to new career fields or for people who have worked off and on for some time (see the mostly true story of Karen Smote , page 156 of To Boldly Go: A Practical Career Guide for Scientists for an example of this) because they de-emphasize the mismatch of past work experience and gaps in work history.

Most people use a combination of these two styles in which work history and relevant skills are presented. Work experience is listed, usually by job title and in chronological order, but this is followed by a description which emphasizes the skills used.

Basic Parts of a Resume

Name and Address

This part is easy: put your name, address, phone number, fax number and E-mail at the top (if you really want to show off you can put the URL for your home page too!). If your resume is two pages long, be sure your name is in the header of the second page.

Objective statement

The objective statement is a one sentence summary of what *you* want. Obviously, this may change depending on what position you are applying for. The objective statement tells the employer at a glance:

- what type of position you are seeking
- where you want to work (presumably in an organization similar to the one you are applying to)
- what aspect of this field you are interested in

The goal of including this statement is to demonstrate that you are well directed towards the position to which you are applying. Clearly, if you have not done your homework and are misinformed about the position or the opportunities in the organization to which you are applying, you will instantly rule yourself out of the competition. For this reason, you should be sure that you *know your audience*.

An objective statement shouldn't be too narrow, too broad or too vague. Saying something like "applicant desires a challenging position utilizing his skills and experience with the opportunity for advancement" would tell an employer that you wanted a job, any job, and that you have no clue what you want. Not the best first impression to make.

Here are some clear concise objective statements:

"Challenging position as computer programmer or analyst incorporating skills in numerical analysis, resource management, and land-use policy"

"Desire position in management consulting organization requiring outstanding verbal, analytical and team-work skills"

"Position as analytical chemist in semi-conductor manufacturing company, specializing in transmission electron microscopy"

Each of these clearly states the employment goals of the applicant, and some also summarize the applicant's abilities. You can clearly see that, in order to construct these objective statements, the applicants would have to have a *very* good understanding of the nature of the job opening.

Summary statement

The purpose of the objective statement is to give the highlights of your qualifications. It is usually one to two sentences in length and contains some or all of the following: your most outstanding skills, years of experience, credentials, areas of specialization, etc. Most of the resume case studies have combined objective statement/summary statements.

Education

The educational background of research-trained scholars is usually outstanding on paper. It is something that people will really notice. A candidate who has a Ph.D. from MIT in Geophysics, and graduated summa cum laude from Vassar College will cause anyone to sit up and take notice. In fact *any* advanced degree in a resume submitted for a position for which an advanced degree is not the norm generally should be thought of as an asset (but see the story of Karen Smote for a counter example). Put the Education section either right under the Objective/Summary statements or at the bottom of the page. Be sure to include academic honors like ___ cum laude in this section, but put other honors and awards in a separate section. Just so everyone is clear on this, you should put the following in the Education section in reverse chronological order:

- Name of institution (Ph.D., Master's, Undergrad)
- Location of institution
- Year of graduation (don't bother with the month)
- Department or major (or dual majors) and academic honors (i.e., cum laude etc.)
- Any professional certificates or accreditations or minors

Do not bother putting in:

- The titles of your theses (that might go in work experience but ONLY if it is specifically applicable to the job opening)
- The name of your advisor
- Your GPA (if it is requested, often along with GRE/SAT scores, list it/them separately)
- Your high school

Some Master's and Ph.D. scholars have reported that they were turned away from jobs because they were "over-qualified." Some have suggested that, in some cases, you should remove Ph.D. from your resume altogether, and pretend that you never went to graduate school (would a stint in prison look better?). If you feel this way, I suggest you reread Chapter 2. A Ph.D. or Master's is a liability *only if you are unable to show a prospective employer the valuable transferable skills you have acquired along the way*. If an employer cannot recognize the value of an advanced degree they lack any imagination or business sense, and would probably be a miserable person to work for anyway.

Experience/Work Experience

This is the place to put down 3-5 experiences/jobs that highlight the set of skills that are most desirable to the employer. These accomplishments should sound substantial and important. They should highlight your skills and talents. Most important, they should bring out the benefit that you had to the organization and *show how you made a difference*. With some categories this might be difficult (such as teaching experience) but in others, such as research experience, you can really make yourself shine. If you have not already done so, go back and reread Chapter 5 and do self-assessment exercise #3. Do it!

Describing these things should involve using action verbs (see the list below) and in an active past or present tense. For example, rather than saying "was responsible for operation, maintenance, student training and certification of users for X-ray Fluorescence spectrometer 1992-1995" say "maintained and operated X-ray fluorescence spectrometer, trained and certified

44 students over 3 years." By using action-rich verbs and numbers, you highlight your accomplishments in quantitative ways (strictly speaking, one should spell out numbers from one to nine, and write out numbers like 23 but numerals tend to stand out and, for that reason, should be used even for single numbers). This latter point of quantifying your accomplishments is very important. Again, it may seem impossible with some topics, such as teaching experience, but if you can at least mention enrollment numbers it is an advantage.

If you are just emerging from grad school, your school research experience may be the first and biggest item, but it shouldn't be the only one. Teaching experience can look good as a separate category, especially if you had real teaching duties as opposed to grading the problem sets from your advisor's class. Summer work for companies or part-time work done while in school is a real asset. If you did something particularly notable in college, that can go in, especially if your work experience is limited, for example being the technical director of a theater on campus. With each of these things you should list the following first as a heading:

- Job title
- Name of the organization
- Location (city, state) of organization
- Time of employment (again, use only years – nobody cares about months)

This information should be all on one line, perhaps in bold (again, see the resume case studies in the next chapter for examples).

Other sections

You may want to include a list of particular skills if you have not already mentioned them in your description above. Computer skills and foreign language skills might go in this separate section. Depending on the job, you might want to mention particular software that you are familiar with. Since most of the "real world" uses C or C++ you should mention if you have some experience in these languages. FORTRAN is not widely used in the programming world these days. You might want to include a section on awards if they are particularly prestigious and recognizable to your intended audience.

What not to include

It used to be cool to add some personal information like hobbies and the like. After all, maybe the reader is an avid hiker like you: dude, you've got it made. Well this is a new century and personal information is not only extraneous, including it on a resume can seem unprofessional. Skip the little section at the bottom of the resume that says you love to ski, hike, shoot large animals, and collect spores, molds, and fungus. Also verboten are the following:

- date of birth
- your marital status
- the number of children you have
- salary requirements

By law, employers are not permitted to ask you your age, marital status, or the number of children you have. They can ask oblique questions such as "do you have any special needs that would affect your performance in this job?" You may think you're doing them a favor by volunteering this information, either in your resume or during an interview, but in reality, it gives

them the impression that you don't know the rules and lack experience in the "real world" workplace.

References

References, if requested, should be listed on a separate page with their full name, job title, place of employment, relationship to you, full address, phone number, fax number and E-mail. Also, don't bother putting the statement "references available on request" in your resume; people know that. References are not accorded the same weight in the "outside world" that they are in the world of research science. Most employers assume that anyone you would list would be able to sing your praises. Employers tend to rely more on the written job materials and the interview from which to base a hiring decision and consult references (most often by phone) as a final check. However, references that are known to the prospective employer can be extremely powerful. These people may get called early, and if they are prepared to sing your praises, you have a terrific advantage.

Do remember to prepare your references for the possibility of inquiries.

Final pointers, tips and advice

Writing a bad resume is easy. Writing a good resume is difficult. It will take time and many drafts. Because research scholars are often targeting several very different career paths simultaneously *it is important to have several different resumes that accent different skills*. It also goes without saying that resumes should be immaculate looking and flawless in spelling and punctuation (bad spelling is the kiss of death so, for heaven's sake, proof-read it and give it to others to read).

Here is a summary of basics and pointers:

- Support your objective/summary statement with your experiences
- Make every word count. Use "I", "my", "a", "an", or "the" sparingly
- Keep to one or two pages (one page resumes are not a "rule" but stretching a resume to two is usually painfully apparent. One and a half is fine.
- No fancy fonts, strange designs or funny colored paper; unless you're applying to be an inspector at a Fruit Loop factory
- Emphasize specific accomplishments, performance, and quantifiable results. Avoid job duties and responsibilities
- In functional resumes, lead with the skill set that is most important for the job
- Use action verbs in past tense
- Be brief, be positive, be specific and BE HONEST
- Use numbers (i.e. 30 instead of thirty)
- Don't make it crowded: 1" margin on all sides, nice spacing between sections and experiences
- Edit and proofread until your eyes water. One mistake is all they need....

Tips for Maximizing "Hits" for Electronic versions of your resume

Many larger companies enter resumes into a database. The database searches through all the resumes and ranks them by the number of "hits" or matches there are with the selected search fields and criteria. By this logic, the more information you provide, the greater the likelihood that your resume will get a hit and ascend the list. Here are some suggestions for maximizing "hits."

- Use enough words to define your skills, experience, education, professional affiliations
- Describe experience with concrete words (for example: "managed an analytical laboratory" rather than "responsible for managing ...")
- Use more than one page if necessary (the computer doesn't care)
- Use jargon and acronyms specific to your field (spell out acronyms for human readers)
- Increase your list of key words by including specifics, for example, the names of software you use, such as Microsoft Excel, Adobe Photoshop, etc.
- Use common headings such as Objective, Experience, Employment, Work History, Positions Held, Appointments, Skills, Summary, Summary of Qualifications, Accomplishments, Strengths, Education, Affiliations, Professional Affiliations, Publications, Papers, Licenses, Certifications, Examinations, Honors, Personal, Additional, Miscellaneous, References, etc.
- If you have extra space, describe your interpersonal traits and attitude. Key words could include "skill in time management," "dependable," "high energy," "leadership," "sense of responsibility," "good memory." See the list of transferable skills and traits to get some suggestions.

Should I prepare a separate "scannable" resume?

If you have submitted a resume for a specific opening, your resume will almost always be forwarded on to the person making the hiring decision after being scanned. Thus, the resume you submit should be intended for human eyes. If you are submitting your resume to an organization, but not for consideration for a specific job, your resume will be scanned and the database will be used to decide whether you are suitable for any future openings. In this case, a resume that includes extra data may help your name rise higher in the electronic queue. So rather than prepare a separate resume you might want to simply add some terms and sections to your regular resume.

Action Verbs for Resume Writing

Management Skills

administered
analyzed
assigned
chaired
consolidated
contracted
coordinated
delegated
developed
directed
evaluated
executed
organized
oversaw
planned
prioritized
produced
recommended
reorganized
reviewed
scheduled
supervised

Communication Skills

addressed
arbitrated
arranged
authored
co-authored
collaborated
corresponded
developed
directed
drafted
enlisted
formulated
influenced
interpreted
lectured
mediated
moderated
negotiated
persuaded
promoted
proposed
publicized

reconciled
recruited
spoke
translated
wrote

Research Skills

clarified
collected
critiqued
diagnosed
evaluated
examined
extracted
identified
inspected
interpreted
interviewed
investigated
organized
reviewed
summarized
surveyed
systematized

Technical Skills

assembled
built
calculated
computed
designed
devised
engineered
fabricated
maintained
operated
pinpointed
programmed
remodeled
repaired
solved

Teaching Skills

adapted
advised
clarified
coached
communicated
conducted

coordinated
developed
enabled
encouraged
evaluated
explained
facilitated
guided
informed
instructed
lectured
persuaded
set goals
stimulated
taught
trained

Financial Skills

administered
allocated
analyzed
appraised
audited
balanced
budgeted
calculated
computed
developed
managed
marketed
planned
projected
researched

Creative Skills

acted
conceptualized
created
customized
designed
developed
directed
established
fashioned
illustrated
instituted
integrated
performed
planned

proved
revised
revitalized
set up
shaped
streamlined
structured

Helping Skills

assessed
assisted
clarified
coached
counseled
demonstrated
diagnosed
educated
facilitated
familiarized
guided
inspired
motivated
participated
provided
referred
rehabilitated
represented
reinforced
supported
taught
trained
verified

Clerical or Detail Skills

approved
arranged
catalogued
classified
collected
compiled
dispatched
executed
filed
generated
implemented
inspected
monitored
operated

ordered
organized
prepared
processed
purchased
recorded
retrieved
screened
specified
systematized
tabulated
validated

Stronger Verbs for Accomplishments

accelerated
achieved
attained
completed
conceived
convinced
discovered
doubled
effected
eliminated (costs)
expanded
expedited
founded
improved
increased
initiated
innovated
introduced
invented
launched
mastered
originated
overcame
overhauled
pioneered
reduced (losses)
resolved
(problems)
restored
revitalized
spearheaded
strengthened
transformed
upgraded

Case study number 1: Janet Tantrum

As an undergraduate, Janet Tantrum knew from the beginning that she wanted to be a geologist. She enjoyed back-packing, skiing, sailing, and just about any other excuse to be outside. She majored in Geology, had a great time as an undergrad, and decided that life could only be better in graduate school. Wary of the commitment and time that it took to get a Ph.D., Janet decided to get her Master's first. She was accepted to every program to which she applied and started the following Fall at Mightybig U.

The three years she spent on her Master's were tough, but rewarding. She produced some original research, taught students, and spent hours in the laboratory fighting with the cantankerous X-ray Fluorescence spectrometer she used to analyze the rocks for her thesis. She made a number of good friends in graduate school, one to whom she became engaged in her final year. He was in his second year in the Ph.D. program.

When Janet finished she was fairly certain that she did not want to go back and invest five more years in order to get a Ph.D.; she didn't want to leave Geology either. A nice opportunity opened up for her shortly before she turned in her thesis – a nearby office of a federally funded agency that carried out geological studies needed a lab technician. She applied, was hired, and for the last two years analyzed rocks and other samples, as well as helping out with other projects.

Things were going fine until the 1994 election, when the funding for her employer became an item on the federal chopping block. Janet was informed, in no uncertain terms, that it was very unlikely that her term appointment could be renewed. She would be out of a job in six months.

This wasn't an altogether unpleasant development. Janet had increasingly become frustrated with the repetition of the lab work, not to mention the paltry pay. While she and her fiancé had planned on leaving the area eventually, he still had at least two more years to go on his thesis. She had no idea how she was even going to support herself. So she did what most people do when they are confronted with a job crisis; she sat down and revised her resume.

Janet's first attempt was pretty good. It featured her work experience and research experience as a graduate student. It was fairly well designed, though a bit hard to read. However, on closer inspection, even she had to admit that it didn't say very much. The descriptions were vague and boring and made her sound like a lab mole who never saw sunlight. Janet described the things she had done so far but gave no indication of where she wanted to go. This wasn't too surprising, considering that she herself still didn't really know.

Janet Tantrum

6445 Temblor Lane
Mello Park, CA 94566

TEL: (415) 555-4666
FAX: (415) 555-2199
spaz@fromage.geo.mu.edu

EDUCATION:

9/90-6/93

Mightybig University, M.S. in Geological and Environmental Sciences
Thesis title: *Petrological investigations of the Cheese Wind magmatic system, Sierra Nevada, California*

8/86-5/90

Washington University, BS in Geology (Civil Engineering minor), May 1990
Senior honor thesis title: *Petrology and geochemistry of the Hugh Hefner Suite, Madison 7.5" quadrangle, Virginia*

EXPERIENCE:

9/93-present

Physical Science Aide/Technician, Unnamed Federal Organization, CA
•Performed mineral separations, prepared samples for geochemistry, made thin sections of samples
•Digitized field maps

1/93-9/93

Geologist, Jello Geotechnical, Inc.; Mello Park, California
•Quality testing of soil and liquefaction data
•Programming in dBase and use of MapInfo to create and customize earthquake databases for hazard/risk modelling

9/90-6/93

Lab Manager, Mightybig University, Dept. of Geological & Environmental Sciences
•Calibrate, maintain, and operate a wavelength-dispersive x-ray fluorescence spectrometer (XRF) used for major- and trace-element analysis of rock samples
•Instruct students in sample preparation and XRF use

6/91-6/93

Research Assistant, Mightybig University, Dept. of Geological & Environmental Sciences
•Field work (mapping and sampling) in Sierra Nevada, California
•Laboratory work with heavy liquid separations, polarizing microscope, scanning-electron microscope, isotope geochemistry (ion exchange columns, mass spectrometry)

9/90-6/91

Research Assistant, Mightybig University, Dept. of Geological & Environmental Sciences
•Maintenance of mineral-separation, rock-crushing, and rock-sawing facilities
•Instruction of undergraduate and graduate students in use of equipment

1/92-4/92

and
10/92-6/93

Teaching Assistant, Mightybig University, Dept. of Geological & Environmental Sciences
•Courses: Introductory Geology, Volcanology, Igneous and Metamorphic Petrology
•Prepared laboratory exercises, taught lab sections, graded exercises and exams

SKILLS:

- Extensive experience with Macintosh and Microsoft Windows-based software
- Experience with UNIX, DOS, and RSX-11M operating systems
- Programming ability in Turbo Pascal, FORTRAN, and dBase
- Presentation of research results at national meetings in both oral and poster formats
- Four years of French, two years of German

Janet the Geotechnical Engineer

On the advice of a friend, she made an appointment with a career counselor at the Career Planning and Placement Center at Mightybig U. He guided her through several self-assessment exercises and got her to arrange several informational interviews. After doing all this, and talking to her friends, she came up with two possible career paths to occupy her for the next two years of her life.

The first was the field of environmental or geotechnical engineering. She had some experience in this field, having worked freelance for a geotechnical firm while she was finishing up her Master's. She liked the work, especially the chance to do much of it outside. She also liked that it called upon the technical skills she developed in her Master's. After conducting several informational interviews and reading a book about the field of geotechnical engineering, she revised her resume to target this particular field (see next page).

As you can see, this resume is much stronger than the original. For starters, it is clear that Janet has a specific objective in mind. Then, using what she learned about the field of geotechnical engineering from the informational interviews, she identified particular skills that were valuable. One of the best aspects of her resume is that she demonstrates her record of performance with numbers. The layout is clean, it is easy to read and has a professional look.

Janet the Freelance Desktop Publisher

In the process of putting together her geotechnical resume, Janet talked to the mother of a friend of hers who, for many years, has been a freelance writer and desktop publisher. Janet discovered that this type of work could pay as well as an entry-level job in a geotechnical firm, but had much more flexibility. Instead of a daily commute she could work from home on a computer she already owned.

Janet learned from her source that one way to get established is to join a temp agency that supplied jobs to technical writers. The quality of the assignments and the compensation were dependent on experience. Hence, she changed her resume again, bringing her technical writing, graphic design and document production experience to the top (see following page).

This resume, like the geotechnical resume, demonstrates her experience in quantitative terms. In addition, the resume lists all the computer programs with which Janet is familiar. Most important, Janet rephrased the descriptions of her past experience to better describe her technical writing qualifications. It is clear that each resume is tailored to the specific industry that she has in mind.

Janet Tantrum

6445 Temblor Lane
Mello Park, CA 94566
e-mail: spaz@fromage.geo.mu.edu
(415) 555-4666

OBJECTIVE: Challenging position as a geotechnical or environmental engineer utilizing proven analytical, computer and communication skills

EDUCATION: **Mightybig University**, Bigville, California
M.S. in Geological and Environmental Sciences **1993**

Washington University, St. Louis, Missouri
B.S. in Geology – Magna cum Laude (Minor in Civil Engineering) **1990**

HONORS AND AWARDS:

Outstanding Teaching Assistant Award, Mightybig University **1992**
Arthur Buddington Award, Department of Geology, Washington University **1990**
National Merit Scholarship, Semi-finalist **1986**

TECHNICAL EXPERIENCE:

Physical Science Aide/Laboratory Technician **1994 - present**
Unnamed Federal Organization, Mello Park, California

- Assisted in chemical analysis of geological samples by optical microscopy and ICP-mass spectrometer
- Digitized and modified topographic, geologic and land-use maps
- Assisted in preparation of 3 published articles and 2 internal reports

Technical Consultant **1993**
Jello Geotechnical, Inc., Mello Park, California

- Collected, measured and evaluated engineering properties of soils
- Developed and programmed custom earthquake databases for seismic hazard modeling of properties using dBase, MapInfo, Microsoft Excel, and GIS software
- Wrote and presented risk assessment reports to clients

Lab Manager **1991 - 1993**
Department of Geological & Environmental Sciences, Mightybig University, Bigville, California

- Calibrated, operated, maintained and repaired x-ray fluorescence spectrometer
- Developed and administered billing and operating procedures that cut laboratory costs by 60%
- Trained 23 users in safe operating procedures

Research Assistant **1990-1993**
Department of Geological & Environmental Sciences, Mightybig University, Bigville, California

- Organized and executed original scientific research on volcanic rocks from Eastern California including: geologic mapping, sample collection and characterization, chemical analysis, and radiometric age dating
- Developed novel technique for mineral separation and characterization
- Wrote 3 research papers (published/in press), presented 5 papers at national meetings and led 10 seminars

ADDITIONAL SKILLS:

Foreign languages *Speaking/writing/reading proficiency in French, German
Computer *Analytical programming in FORTRAN, Turbo Pascal and dBase
*Experience with UNIX, DOS, Apple and RSX-11M operating systems

Janet Tantrum
6445 Temblor Lane
Mello Park, CA 94556
e-mail: spaz@fromage.geo.mu.edu
(415) 555-4666

OBJECTIVE: Freelance or part-time position as a technical writer/graphic designer utilizing extensive computer experience and effective communication skills

WORK EXPERIENCE:

- Physical Science Aid/Technician** **1993 - present**
Unnamed Federal Organization, Mello Park, California
- Digitized and modified topographic, geologic and land-use maps
 - Assisted in the preparation of 3 published articles and 2 internal reports
 - Drafted and modified scientific figures for publication
- Technical Consultant** **1993**
Jello Geotechnical, Inc., Mello Park, California
- Wrote and presented publication-quality risk assessment reports for clients
 - Designed and produced technical and schematic graphics using Adobe Illustrator, Adobe Photoshop, MacDraw Pro, and Superpaint
 - Developed and programmed custom earthquake databases for seismic hazard modeling of properties using dBase, MapInfo, Microsoft Excel, and GIS software
 - Collected, measured and evaluated engineering properties of soils
- Teaching Assistant** **1991, 1993**
Department of Geological & Environmental Sciences, Mightybig University, Bigville, California
- Designed, prepared and taught laboratory exercises to 30 students
 - Prepared 85 page laboratory exercise book with 40 original figures and diagrams
 - Developed exam materials and graded course work with professor
- Research Assistant** **1991 - 1993**
Department of Geological & Environmental Sciences, Mightybig University, Bigville, California
- Organized and executed original scientific research on volcanic rocks from Eastern California
 - Wrote 3 research papers (published/in press), presented 5 papers at national meetings and led 10 seminars
 - Designed novel laboratory device using Microsoft CAD/CAM

COMPUTER SKILLS:

- Extensive computer graphics design experience using Adobe Illustrator, Adobe Photoshop, MacDraw Pro, Claris SuperPaint, and Microsoft CAD/CAM
- Advanced programming ability in FORTRAN, Turbo Pascal and dBase
- Advanced word processing skills with Quark Xpress, Microsoft Word, MacWrite
- Extensive experience with Macintosh, Windows, UNIX, DOS, Apple and RSX-11M operating systems

- EDUCATION:**
- Mightybig University**, Bigville, California **1995**
M.S. in Geological and Environmental Sciences
- Washington University**, St. Louis, Missouri **1990**
B.S. in Geology – Magna cum Laude (Minor in Civil Engineering)

Cover Letter Hints

Cover letters are as important as your resume. Though they do not get the repeated scrutiny that your resume does, they serve to form the first impression for the person who will be handling your resume. They also indicate your ability to write! For scholars a cover letter is particularly important because a research background may initially seem at odds with the job description. For this reason it is critical that the research scholar explain why someone with a science background is applying for this job (if it is indeed a non-technical position). Most importantly, a cover letter should make the reader want to seek out information in the resume. Your cover letter, like the ones you use when you submit publications or grants, should be striving to MAKE THE SALE. Here is a summary of some suggestions:

Overview

- *match* their job description with your background – use their words
- write to the department head or connection person vs. personnel department
- be concise (only one page)
- stress the positive (do NOT lay on a sob story about being an unemployed scholar)
- avoid cover letter clichés:
 - "thank you for your consideration"
 - "enclosed please find"
 - "attached is my resume"

First paragraph

- How you heard about the position or organization
- What your objective is
- Why you are interested in the position

Second paragraph

- Expand on the qualifications from your resume that are the most relevant (2 or 3)
- Statement about how your background is a good fit
- Be specific and don't apologize for anything

Third paragraph

- State what you would like to see as the next step with a time frame
- Thank them for their consideration (see above!)

I have not included any cover letter example this time because people cannot seem to resist the temptation to COPY IT.

There is no right answer, folks, just be your own dog. This is your opportunity to be more than your resume, your chance to expand on who you are – take it! Make it you! And make sure you let a friend proof-read it before it goes out the door.

Interviewing tips for the Ph.D.: Dashing the stereotypes

You would be surprised what people think of Ph.D.s. In general people assume we scholars are smarter and nerdier than we actually are. Some are downright intimidated. As you talk to people in the "real world" be aware that you may have to dispel some strange preconceptions they have about you because you have a Ph.D. or a Masters. You may also realize that you harbor similar preconceptions about people in other career paths, such as business or law.

What Kind of Interview is it?

- *Screening interview*
- *One-on-one interviews*
- *Phone interview*
- *Panel/Committee interviews*
- *Case study interviews*
- *Stress interviews*

What Will They Ask?

"Aren't you overqualified?"

- explain how you are HIGHLY qualified, but not overqualified
- tell them that you will be up to speed quicker

"What is your greatest strength?"

- talk about one of your best skills that RELATES to the job
- give a concrete example of how you used it

"What interests you about this job?"

- this one seems straightforward, but you'd better be sure you KNOW enough about the job.

"Describe a situation in which your work or idea was criticized."

- choose an example in which involves constructive criticism of your work
- be sure to tell them how you rectified the situation

"Describe a project in which you demonstrated _____ ." (fill in the blank: leadership, teamwork, initiative, problem-solving skills, ability to take criticism, etc.)

- tell a story (a SHORT story) about a specific incident, not just about what you did, but about the final result.

"What is your greatest weakness?"

- save absolute candor for your therapist. Describe a weakness that could be considered a strength.
- avoid cliché answers like "I'm a perfectionist"

- show how you have compensated for the weakness, perhaps by relying on help from others in the team.

"Why are you leaving research science?"

- accentuate the positive, don't tell them you were miserable, or that you could never find a permanent job, tell them that you are looking for new challenges and a place where you can apply some of the abstract knowledge you have learned in grad school.

"So tell me about yourself?"

- focus on how your background relates to the job
- limit your answer to less than 3 minutes
- try to explain how your background and experience has directed you to this job

Techniques for answering questions

Situation/Task: Describe the situation you encountered. Give the background, and its relation to you.

Action: Describe what YOU did to address the situation or solve the problem

Result: Describe the result of your actions

An example

"Tell me about a situation in which you showed initiative."

Bill responded:

"One example is my development of the PointerCalc software package, which I did while in graduate school. When I was working on my thesis research I had to develop several computer programs to manipulate and project the gravity data I was using onto a map or globe. After finishing up the programs, other people began asking me for copies so that they could do the same manipulations with their data. While I could have simply given them copies of my programs, I realized that some of their data sets would not be compatible, so instead I rewrote my programs to accommodate a wider variety of vector data. I did this mostly because I enjoyed programming and because I thought it would be so much easier if one person made a general program rather than everybody having to make specific variations in my code to suit their individual needs. Plus, it didn't take very long. After circulating my revised programs throughout the department, I began getting requests from researchers in other institutions! After one year, I had over 1000 registered users on the software in a variety of fields. While I have always provided the software and its upgrades at no charge I have ended up benefiting enormously from their popularity."

What shouldn't they ask?

- your religion, political beliefs or affiliations
- your ancestry, national origin or parentage
- the naturalization status of your parents, spouse or children (they can ask whether or not you are a U.S. citizen or the status of your visa)
- your birthplace
- your native language (they can ask about the languages you claim to speak on your resume)
- your age, date of birth or ages of your children (they can ask whether or not you are over 18)
- your maiden names, or whether you changed your name, your marital status, number of children or spouses occupation (this is the most commonly encountered illegal question asked of female job applicants)

Some final advice on interviewing

- Arrive early—give yourself 10-15 minutes to sit and chill out
- Case the joint—if it is in a place you've never been before, swing by the day before just to make sure you know how to get there. The assurance of having been there before will help
- Bring along extra copies of your resume
- Give a good handshake—if you are unclear about what a good handshake is, go try out your handshake on your friends
- Make eye contact—one simple technique for ensuring that you have made good eye contact: make a mental note of the color of your interviewer's eyes
- Ask questions—it's better to be clear about the question at the start than go rambling down some tangent
- Be yourself—people tend to do a poor imitation of anything else but!

Negotiating an offer

Delay salary negotiations as long as possible

Value yourself and the job properly

- health care: who is covered, what's covered, what's not, what are the co-pays and premiums?
- schedule of raises
- bonus plan
- commission plan
- stock option
- pension plan
- profit sharing plan

- employee education/tuition reimbursement
- dependent tuition reimbursement
- paid parking
- car provided
- vacation
- sick leave
- maternity/paternity leave
- flex time/alternative work schedule
- anticipated work hours
- relocation allowance
- potential for advancement
- stability of company

How to get the offer raised

Consider the factors listed below. The more that are true, the greater your flexibility:

- You possess unique abilities
- They have few other candidates for the job
- The search has been going on a long time
- This is a unique position in the organization
- The organization is flexible in general
- You have other offers
- They really need someone soon

In contrast, you will have less flexibility to negotiate salary and benefits if the following are true:

- The job is at an entry level and similar to others in the organization
- The organization is highly structured and rigid
- The organization expects you will take what is offered

In an interview situation be sure to dispel some of these misconceptions.

According to business people, academics/scientists are:

- simple minded about money
- impractical about time
- no sense of deadlines
- socially passive
- value ideals as absolutes

According to academics/scientists, business people are:

- mercenary

- driven by time
- non-reflective
- slick and superficial
- socially aggressive
- bottom line is everything

Other potential perceptions to overcome:

- hermit vs. leader
- arrogant vs. team player
- rebel vs. organizer
- solution person vs. problem person

Critical Leadership Skills for Young Scientists

modified from - Joe Hodowanec, Career Strategy Advisor

Developing the following 10 leadership skills will allow you to become the kind of technical leader you have always wanted to be, the kind of leader who instills trust and a sense of purpose in colleagues, students and staff, empowering them to do what they do best and urging them on to become their best. Here are 10 characteristics that define a truly great technical leader.

1. **A strongly defined sense of purpose:** The hallmark of an effective leader is clear focus and direction coupled with the ability to articulate his/her purpose to outsiders and employees. Successful leaders operate with a vision of where they and their science are going, and they use this vision to inspire their people and their organization. This clear vision and focused direction allows leaders to align and direct the energy and resources of the organization to achieve desired results, and to win the confidence of funders and peers.
2. **People skills:** Leaders must have the capacity to motivate and inspire, to bring out the best in people, even in hard times. Employees' responsibilities vary in terms of complexity and breadth. However, an effective leader conveys the attitude that everyone plays a critical role in the success of the lab, department or organization regardless of what official job title they have.
3. **Technical literacy:** A leader must know and have a real feel for their science. Leaders must know how to process large quantities of conflicting information and be able to get ahead of the competition by seeing what must be done. He or she has to know how to track the progress of their group and communicate this to others.
4. **Candor:** The leader needs candor. That's tough because most organizational studies show that seven out of ten people in organizations don't speak up if they think their point of view will vary with conventional wisdom or their boss's point of view, even if they believe their boss is going to make an error. What the leader needs to cultivate are firm-minded co-workers with the wisdom and courage to say no.

5. **High standards of ethics and integrity:** The core competency of leadership is character. As Warren Bennis said in his classic book *On Becoming a Leader*: "Get a leader with only drive but not competency and integrity, and you get a demagogue. Get someone with competence but absent integrity and drive, and you get a technocrat. Get seduced by someone who has ambition and competence but lacks integrity, and you get a destructive achiever."
6. **Judgment:** Leaders must have the ability to make quick decisions with imperfect data. They need to objectively and realistically analyze a problem or situation, which is an important first step in making sound decisions. It has been said many times but it bears repeating: It is not enough for a leader to do things right; a leader must do the right thing.
7. **Select, coach, and develop others:** Leaders must have the ability to select the right people, not clones of themselves but people who can make up for their deficiencies. Remember, one of the most important roles of leaders is to generate more leadership within the organization.
8. **Champion and embrace change.** Departments, research groups and entire fields of science stagnate if they don't change to embrace new technologies, address societal needs, adapt to shifts in funding priorities, or seek out new research opportunities. Effective leaders are fearless explorers. They seek out, initiate, support, and manage needed change; they are "change champions."
9. **Constancy:** One of the things you hear about least effective leaders is that they do whatever the last person they talked to recommended. Or that they plunge ahead with the last good idea that pops into their heads. To trust a leader, followers have to know what to expect. So sometimes the leader has to put off a grand idea until he or she has had a chance to convince his/her own allies. In science as well as in business, the effectiveness of a decision is the quality of the decision multiplied by the acceptance.
10. **Willingness to be accountable:** Leaders are able to hear tough unpopular news, absorb it calmly, and immediately shift to creative discussions and solutions. After all, every organization needs a leader who at some point can say to the world: "The buck stops here."