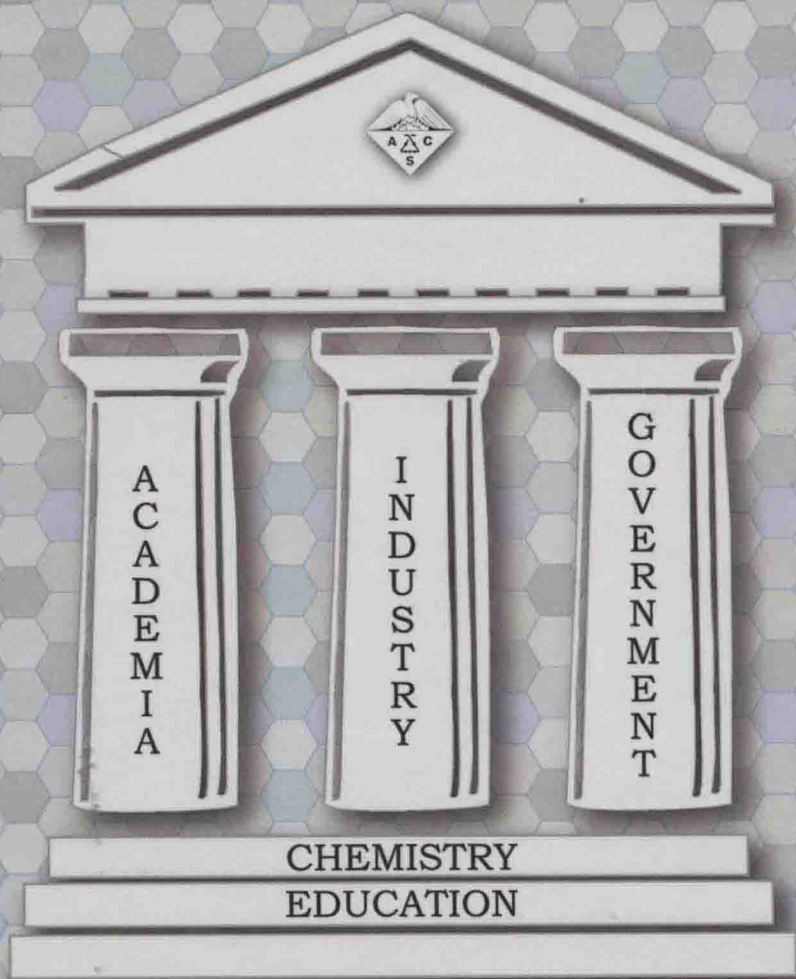


CS SYMPOSIUM SERIES 1165

What You Need for the First Job, Besides the Ph.D. in Chemistry



EDITED BY
Mark A. Benvenuto

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What You Need for the First Job, Besides the Ph.D. in Chemistry

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What You Need for the First Job, Besides the Ph.D. in Chemistry

Foreword

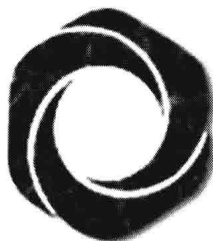
The ACS Symposium Series was first published in 1974 to provide a mechanism for publishing symposia quickly in book form. The purpose of the series is to publish timely, comprehensive books developed from the ACS sponsored symposia based on current scientific research. Occasionally, books are developed from symposia sponsored by other organizations when the topic is of keen interest to the chemistry audience.

Before agreeing to publish a book, the proposed table of contents is reviewed for appropriate and comprehensive coverage and for interest to the audience. Some papers may be excluded to better focus the book; others may be added to provide comprehensiveness. When appropriate, overview or introductory chapters are added. Drafts of chapters are peer-reviewed prior to final acceptance or rejection, and manuscripts are prepared in camera-ready format.

As a rule, only original research papers and original review papers are included in the volumes. Verbatim reproductions of previous published papers are not accepted.

ACS Books Department

Preface



“I never let my schooling interfere with my education.”

- Mark Twain

It is fair to say that most chemists and chemical engineers who earn a Ph.D. in their field take their schooling much more seriously than Mark Twain, aka Mr. Samuel Clemens, apparently did. However, his aphorism does make the poignant observation that schooling and education is not always the same thing. This volume is an attempt to educate, to provide a source of information, knowledge, and wisdom to the person who has spent so long, and worked so hard, on his or her schooling.

The Council for Chemical Research and the American Chemical Society have both spent considerable effort over the past decades focusing on how to ensure that graduate education in the chemical sciences remains at the absolute highest caliber, and produces the best possible professionals. The ACS is justifiably proud of its publications on education, including the downloadable document, “Graduate School Reality Check,” and the recent presidential commission report, “Advancing Graduate Education in the Chemical Sciences.” Additionally, it has spearheaded active graduate education efforts within the Division of Chemical Education and elsewhere for decades. The Council for Chemical Research has maintained an active Graduate Education Action Network for nearly thirty years. Yet in that time, neither organization has specifically asked what a person needs to be successful once they have both the Ph.D. and the first job in hand.

Put succinctly, there is much more to being successful in a career in chemistry than just the hard-earned Ph.D. degree.

This volume is based on the symposium “What You Need for the First Job, Besides the Ph.D. in Chemistry,” held at the 246th National Meeting of the American Chemical Society, which took place in Indianapolis, Indiana in September, 2013. But the book and symposium are also the result of several

chapters authored by leading scientists who were not able to attend and present at the symposium, but who were kind enough to contribute chapters based on their years and/or decades of experience in corporations, government labs, and academia. This book is the result of seeds that were planted during numerous informal conversations at the annual meetings of the CCR, as well as during such discussions at national and regional meetings of the ACS, and at the ACS employment clearing houses. It was felt that the same intense focus a person needs to earn a Ph.D. might actually work against the attention to other details needed in order to be successful once he or she has obtained a position.

Leaders want to ensure that new hires are working effectively toward tenure, are quickly becoming productive members of their corporate team, or are well integrated into their government laboratory research group. While it is easy to lump factors other than technical competence in one's job under the term "soft skills," this is an oversimplification. This book represents an attempt to have voices from all three pillars of the chemical enterprise — academia, industry, and government laboratories — heard in terms of telling us what is important for their newly hired Ph.D.-holders. Drs. Truitt, Selcuk, Ranbom, and Plaumann do this from perspectives within the corporate world, while Drs. Sullivan, Snyder, and Bohn do so from points of view in government laboratories. Successful academic leadership is discussed by Prof. Donohue and Kilburg, while several other viewpoints from within the academic sphere are provided by Profs. Bodner, Mio, Otto, Marincean, Kolopajlo, Howell, and Ray. Thank you to all of the authors, as well as to the numerous reviewers who have checked these chapters. A special "thank you" goes to Ms. Megan Klein of Ash Stevens, who willingly took on the task of performing numerous chapter reviews, and who made several valuable suggestions.

Perhaps obviously, no such book can present perfectly all the additional factors and requirements that enter into every possible equation which equals success in a chemical career. We hope though that we have made a very good attempt at it. We also hope that even though this book is not quite as witty and succinct as Mark Twain's one-line comment made over a century ago, it will be a valuable resource for as many years.

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Corporate Jobs

Chapter 1

What Do You Need for the First Industrial Job, Besides the Ph.D. in Chemistry?

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A chemist's first industrial job after leaving school or a post-doctoral appointment involves a transition to a work environment oriented around commercial imperatives along with the scientific or engineering principles from the recently ended educational experience. Four attributes of industrial chemist job success are described. They are business awareness, team skills, time management, and communication skills.

All chemistry students leaving graduate school or academic post-doctoral appointments expect new experiences in their first job as an industrial scientist. You are entering a new environment and an interesting learning experience. Not so apparent is that you will go through a transition period involving changes that are sometimes stressful, especially if they are not expected. At the start of the author's own first job experience, it was quickly apparent that my technical education and personal development would be continuing with some intensity, not downshifting after graduate school. Showing up with technical expertise and a sincere welcome from my new boss and colleagues was the beginning of another education, and I had a lot to learn quickly.

Having coached or supervised many people in their first industrial scientist jobs, a few general comments are possible about culture, skills, and behaviors that really matter. With this essay, I offer insight and advice that I believe will minimize the length and stresses of that transition. To help those still choosing their work-life direction, I provide some perspective on how an industrial chemist career often begins.

Before the advice, here is context for the recommendations to come. First and foremost, keep in mind the mission: You were hired to assist a commercial enterprise. Even if your job is a technical function in early stage research, you are ultimately expected to contribute to business success. Though that may seem obvious, I find this perspective is not given enough emphasis, is sometimes a surprise, or is ignored. So, as well as social and organizational orientation in your new job, pay attention to the company's business and your role in it. You will find company commercial needs have an overarching influence on your job. Business imperatives influence technology directions, organizational culture, and career paths.

With that context, I selected four success factors that should assist with the transition period from student to effective industrial scientist. These factors are found in diverse business environments and have paid the greatest benefit when addressed, in my experience. Out of many possible topics, the four are business awareness, team skills, time management, and communication skills. Obviously there are other important issues, including some that will have great relevance to your particular situation beyond the four I selected. To capture topics crucial to your new job, I suggest that you ask about job success factors as you begin working with your supervisor and new colleagues. You can properly emphasize the four I chose after those conversations.

Business Awareness

We start here because I find it is the perspective most commonly overlooked by new employees. Start early knowing the value of what you do and who cares. With every new assignment, you should know how you fit into the big picture. Clarity about your work's value leads to good decisions about where to put your efforts and making appropriate commitments (time management is discussed later), but also where to contribute beyond basic obligations. Learn the priorities and imperatives. Understand what is important to your employer's business, and what is urgent. Understand what makes your department, your division, and your boss achieve their objectives. Ensure your efforts are related to goals that matter and are in proportion to their priority.

Joining any new organization will require technical acclimation and socialization time, but as early as possible, identify and begin to participate in high priority programs, projects, and goals. Performance appraisals and salary increases are affected by the impact of your work. In the long view, career progress, which usually results from increased responsibility, is a function of your cumulative accomplishments and their business/division impact. Access to job opportunities and greater independence to define your role can also come from a record of consistently helping where it matters most.

It should be no surprise that all initiatives are not equally urgent and that priorities shift. However, putting emphasis or too much time on lower priority goals is a common performance problem with new employees, arising from being misinformed about priorities, not willing to say no to requests from influential project leaders or colleagues, or from just ignoring a company imperative he or

she finds uninteresting. Exploratory work and pursuing personal ideas beyond objectives are important, but they must be done in addition to, not instead of, addressing critical business needs. Deciding how to accommodate what is urgent without ignoring what is important is a constant tension in a business environment. I will return to this topic in the time management discussion.

Learn key values. Every company culture has preferred behaviors and operating values. There are usually some that matter very much. Actively developing them and ensuring they are followed is everyone's responsibility. An outstanding example is safety. Safety is a universal value in the chemical industry, where accidents can cause permanent injury or fatalities and sometimes have significant financial consequences. Typically, there is little tolerance for carelessness and none for negligence in following safety rules. Examples of other values cited on company websites include quality (meaning meeting customer expectations), people development, market leadership, innovation, and being entrepreneurial.

How you work is as important as what you do. Cultures vary considerably, but there are always core rules, especially the boldfaced or bright red boundary lines in company values.

Teamwork

In a company, which is literally a group of people, getting significant things accomplished depends on effectively interacting with others. Teams and good teamwork matter in industry. They are more likely to be engines of project success than individual efforts, and there are myriad examples of how poor team effectiveness is deadly to projects. I recommend that you actively seek collaborations and assist wherever you can throughout your career.

Collaboration is a key success factor because valuable problems tend to be complex and available resources are usually scarce, especially time. Your significant progress in complex assignments or new environments benefits immensely if you have partners with complementary expertise, experience, or knowledge, who share your goals. Intensive collaboration is a disconcerting new activity for some new-to-industry scientists who may have had a solitary or competitive existence prior to the first industrial job, but there is no way around working with others in industry. At a minimum, everyone has a boss, customers, and support providers.

Of course there are individuals who start businesses essentially by themselves, develop new products, or make technical breakthroughs. But by far, especially for moderate to highly complex or innovative projects, teams are responsible for results that matter. Even in smaller companies where individuals carry many roles and proportionally carry more of the responsibility for results, it is often pairs and trios of collaborators that pull everything together. Hard problems, when solutions need to be exactly right, multicomponent projects needing breadth of expertise, or just a critical level of effort for speed, are where teams become progress multipliers.

Another reason you need to become collaborative in industry: job functions are distributed. Except in the smallest industrial lab, you will be handing off parts of your projects or be handed someone else's, depending on your role and expertise. There is either not enough time to sequentially accomplish tasks or some deep expertise may be needed to get all parts of the program done. A typical industrial project requires specialists to do their unique part and project managers to coordinate all the concurrent efforts toward a goal.

Function specialization extends into the whole enterprise. Companies of a certain size and larger are organized in separate commercial support and development components. Typically these are research, development, production, and sales/marketing. There are also separate infrastructure components that enable those functions, like purchasing, technical services, and human resources specialists. Each has special processes and knowledge, and all these efforts must cooperatively contribute to sales and profitability. A new employee's transition into this specialization paradigm requires understanding how your role contributes eventually to commerce, and how you fit into the organization of people and processes that must all work together. It also presumes you work effectively with others to get things done. Looking in the reverse direction, poor collaborators are poison to project health. It is a tough career path for those who are notorious for interacting poorly with people, no matter whatever else they bring to the job.

As a new scientist in this kind of environment, quickly embrace collegiality with high levels of information and idea sharing, and sharing credit for success. Effective teamwork is based on trust among the members. A reputation for hiding results, ignoring assigned partners, or not valuing other project members for their contributions is a substantial career impediment.

Time Management

You may join a company that plunges you into the swirl of business priority chaos on your first day. On the positive side, if that happens, you can learn a lot quickly and make life-long friends among your coworkers by coping together. The most common experience, however, is a more gradual integration that ends when the assignments get complicated and having enough time becomes a daily dilemma. When the job responsibilities mount, orientation efforts get much less attention.

Time spent getting oriented and acquiring knowledgeable is a great investment, and the forbearance given to new employees is not likely to return. As much as you can, use the first days and weeks to learn about people and rules, and have them meet you. Don't abandon this important but unfortunately unsustainable opportunity to meet people, learn the new jargon (and acronyms!), learn the critical technologies, and begin assignments designed to integrate you into the community. Spend as much time as you can reading and learning from experts and veterans. Even though it is a period with a flood of HR new-employee courses, safety training, and one-on-one introductory meetings with your new stakeholders, your management and your key coworkers, don't stop this learning phase too quickly.