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Introduction

The interactions of scientists in the workplace are often fascinating to the lay public because they expose the human element of endeavors that would otherwise be suitable only for textbooks. What is so riveting, and at the same time paradoxical, about these accounts is the immense impact of human interactions on the process and outcome of a scientific project. James Watson's account (Watson 1968) of his and Francis Crick's rivalry with Linus Pauling, their acquisition of data from and interaction with Rosalind Franklin, and their amusing and fruitful interactions with each other have been eagerly read by scientists and laymen alike. Stories about the effects of rivalries, collaborations, and relationships on the daily conduct of science, which is often imagined to be a purely rational and intellectual endeavor, are endlessly fascinating.

Despite the lively debates and discussion generated by Watson's book, little if any analysis has focused on whether the working relationships among the various protagonists could have been more productive. In this book, we have tried to fill that void and, by doing so, show that there are ways to train scientists and run science organizations that improve the conduct of science, facilitate communications, and maximize productivity.

Science training programs are designed to impart technical skills and scientific knowledge to their trainees. The fact that these same programs provide no training in management nor interpersonal skills sends trainees the implicit message that these skills are largely irrelevant in science. In this sense, educational institutions have two characteristics in common with most science- and technology-based organizations: (1) a single-minded focus on technology and (2) a lack of appreciation for the importance of social and interpersonal skills.

Among scientists in all fields of specialization is a strongly held belief that if you just get the science right, everything else will fall into place or become irrelevant. Yet experience shows that this belief is false. Analyses of the chemical industry (Perrow 1993), the space program (Vaughan 1996), and military campaigns (Cohen and Gooch 1991) highlight the central role that human interactions and group dynamics have in their success or failure. It has been proposed that the principal reason military commanders fail to learn from military disasters is the tendency of analysts to focus exclusively on technical and logistical explanations for failure (Cohen and Gooch 1991). This narrow focus betrays naïve indifference to the importance of human interactions and communication and to the individual and organizational characteristics that foster them.

One could make the same indictment of scientific enterprises. For example, the challenges faced by the pharmaceutical industry to replenish their diminishing drug pipelines have been discussed and reviewed extensively (one might say obsessively) during the past decade or more. Pharmaceutical companies struggle to find new operating models or paradigms to improve the

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discovery and development of new therapeutics. Most often, these approaches focus on the application of new technologies or tools (e.g., high-throughput screening, genomics, genetic knockouts, RNA interference) or new ways to structure the companies themselves (i.e., GlaxoSmithKline's Centers of Excellence for Drug Discoveries). Like technical and logistical analysis of military failures, these approaches address only one facet of what is likely a multidimensional problem. Other facets might include improving the communications, management, and leadership skills of those engaged in, or managing, the scientific enterprise. It is an encouraging sign that during the last decade, some of the best and most insightful of the big pharmas have started providing some management training for their scientists. But what kind training are they actually providing?

Efforts to train scientists and science managers to function beyond the lab bench are often limited to project management, running meetings, doing performance reviews, and team building. Although scientists are efficient at learning the nuts and bolts of management—Gantt charts, work plans, etc.—mastery of these skills cannot compensate for poor self-awareness and a paucity of empathy. Without these and other personal and interpersonal skills, managerial functions will be implemented in a mechanical fashion, without heed to individual, interpersonal, or group nuances. Managing in this way makes no more sense than driving a car blindfolded: You may know how to manipulate all the mechanical controls and levers, but you are dangerously blind to context and feedback.

Interpersonal skills can be taught. For some, the abilities to relate productively, to notice how others respond to you, and to forge both personal and professional bonds come naturally. For others, and this includes many science and technical professionals, these skills are not an integral part of their personalities. Fortunately, you do not need to change your personality to become interpersonally savvy.

Interpersonal skills comprise a set of behaviors and responses that can be learned. Such learning can and should be part of the professional education of scientists. In the chapters that follow, Carl provides examples from his own career, illustrating how adopting some of these skills has influenced his development as a scientist, mentor, and leader.

Our experience with the workshops that we have run shows that scientists are eager to learn the skills presented in this book. We have also found that the best way to learn them is to try them and use them. Despite the fact that many scientists are initially reluctant to test new skills in role-playing exercises, their experimental nature quickly takes over. Most are ultimately convinced by the data—their own improvement as negotiators during the course of the workshop. For scientists, data rule!

It takes practice and skill to be able to observe yourself, capture what you experience, and view your behavior, body language, and facial expressions as others do. It also takes skill to attend to how others act and react to you. These skills include new ways of listening—in a manner of speaking, listening between the lines. The first section of this book describes how to acquire these skills or to improve on those you already have.

The first three chapters of the book provide a set of core skills and concepts that serve as the foundation for much of what follows. Chapter 1 provides you with the opportunity to examine your behavior in the scientific workplace in light of what is known about scientists in general. Two self-assessment exercises help you to discover which facets of self-awareness and interpersonal skills you need to work on. Chapter 2 offers guidelines and exercises for developing or improving these skills. We teach you to become an active observer of yourself and

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others and how that informs you of your feelings, helps you to choose appropriate behaviors, and enables you to assess the effectiveness of new behaviors. Chapter 3 shows how to apply your skills of self-observation, self-management, and observation in the context of negotiation. This chapter presents a framework for using these skills to guide you through the difficult situations you encounter every day. We also show you that learning and practicing negotiation is one of the best ways to acquire and improve your interpersonal skills and put them into practice.

The second section of the book teaches you to apply your new skills and powers of observation to three interpersonal domains—with employees, with peers, and with bosses. Chapter 4, written by popular demand, is new to the third edition. It introduces a data-driven approach to identifying, selecting, and hiring scientists and managers of scientists and provides guidance to help recognize and mitigate the impact of bias (including gender and racial) in hiring decisions. The chapter offers step-by-step guidance and editable (and downloadable) forms that you can use to help you evaluate and rank applicants. We think that this chapter will make a significant difference in improving how you go about hiring scientists.

Chapters 5 and 6 answer the question "Now that I've hired my group of scientists, what's the best way to manage them and keep them productive?" Chapter 5 offers methods for improving your effectiveness as a manager or leader of other scientists and alerts you to the most common problems when managing teams of scientists. Chapter 6, another new chapter in this edition, provides guidelines and tools for keeping your team productive and on track. This includes how to set realistic but challenging goals for scientists, how to give feedback that improves performance, and how to let scientists know whether they're performing up to your expectations. Chapter 7 extends the theme of managing scientists into the realm of groups and teams. In this chapter, we specifically focus on the all-important theme of running team or group meetings, the pitfalls and roadblocks that leaders may encounter, and how to recognize and manage them. Chapter 8 shows you how to use your new management skills when dealing with your boss. There, we illustrate the most common problems that scientists have with their bosses and the most effective ways of handling them. Building on the previous chapters, in Chapter 9, we show that improving your ability to recognize and deal with conflict, along with practicing the skills you learned in previous chapters, will improve your ability to interact productively with peers.

The final section of the book addresses special management problems associated with the organizations in which scientists work and study. Chapter 10 describes how trainees and mentors can use self-awareness, observation, and interpersonal skills to survive in and improve the academic training experience. Chapter 11 shows how these same skills, as well as an understanding of the unique challenges that accompany the transition from academia, can improve the productivity of scientists in the private sector. Chapter 12 addresses the concept of leadership. We explore what we mean by leadership in a scientific setting and provide concrete steps you can take and behaviors you can adopt to hone and improve your leadership skills. Finally, Chapter 13 provides a review of the skills that we have presented using an extended case study. This last chapter also suggests ways in which you can use the concepts and tools that we have introduced to improve the practice of science and productivity in your own organization and concludes with recommendations on how leaders can help make their organizations more inclusive.

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At the end of most chapters, we provide exercises and experiments designed to help you acquire and practice the skills that we present. In some cases, the exercises are in the form of experiments that allow you to use and evaluate the effectiveness of new behaviors. Use the ones that work for you.

If you believe that there is more to leading in science than intimidation, more to interacting with your peers than jockeying for advantage or withdrawing when others do, and more to working with your boss than being defensive or resentful, you will find this book valuable. If you believe this but haven't a clue as to how to change your behavior, read on. The skills that you learn will enable you to better identify, focus on, and achieve your objectives, making you more productive and effective. Finally, and perhaps most importantly, you will learn to accomplish all of this in a way that promotes openness and trust in your interactions with others.

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