

## PREPARING STEWARDS OF THE DISCIPLINE

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*Chris M. Golde, The Carnegie Foundation  
for the Advancement of Teaching*

*We view the doctorate as a degree that exists at the junction  
of the intellectual and moral. The Ph.D. is expected to serve as  
a steward of her discipline or profession, dedicated to the  
integrity of its work in the generation, critique, transformation,  
transmission, and use of its knowledge.*

—Lee S. Shulman, President, The Carnegie Foundation  
for the Advancement of Teaching

THE FIRST DOCTORATE in the United States was awarded in 1861; by 1900 a total of about 3,500 doctorates had been granted, and by 1960 the annual production exceeded 10,000 per year. Now, at the start of the twenty-first century, more than 40,000 doctoral degrees are awarded annually. The number of universities granting doctorates has grown from 14 in 1920 to over 400 today. Whereas Americans once went to Europe for the doctoral degree, now people come from around the globe to pursue the doctorate in the United States. By many measures, this is a tremendous success story.

By other measures, the story is not so clearly one of unqualified success. Indeed, throughout this century of maturation, the purpose of the

doctorate has been questioned, beginning with William James's essay "The Ph.D. Octopus," in which he warned against the development of "a tyrannical machine with unforeseen powers of exclusion and corruption" (1903, p. 152). Although there is strong evidence that doctoral recipients trained in the United States are excellent researchers and scholars and can look forward to rewarding careers, it is important to continue to strive to make doctoral education the best possible preparation for the next generation of disciplinary leaders. Disciplines continue to change, as do universities, the job market, the character of professional work, and the student population. Over time, changing conditions may mean that doctoral programs no longer effectively meet their purposes, as some practices are rendered obsolete. In fact, doctoral education may have lost sight of its central purpose.

Some of the most important changes in the context of graduate education include:

- *Time-to-career continues to increase.* In the sciences, the current expectation is that a new Ph.D. must complete one or two post-doctoral positions before being eligible for a permanent position. Likewise, humanities Ph.D.'s are likely to take a series of temporary positions before securing a tenure-track job.
- *Every discipline is evolving, with its boundaries expanding and changing.* The resulting redefinition of intellectual identity is often fraught with tension. The challenge for doctoral education is to help students be flexible and interdisciplinary, and to balance this with the enormous amount that students are expected to know.
- *Financial support for doctoral students is a complex and dynamic ecosystem, dependent on changing federal and state priorities.* In the science fields, students are supported on a faculty entrepreneurship model, in which externally funded research supports graduate students as well as faculty. In the humanities, students are supported by a combination of university fellowships, teaching positions, and debt. There is considerable difference among universities and departments in whether and how students are supported.
- *Although research is largely an international enterprise, federal policies affect flows of students into and out of the United States.* Currently, the number of international graduate students coming to the United States is shrinking. At the same time, other countries are reaching out to those students, and many national systems are being systematically improved.

Although conditions are changing, some vexing problems seem to perpetually plague American doctoral programs. Studies and reports of the 1990s echo their counterparts from the 1970s and 1980s, emphasizing ways in which conventional doctoral programs do not meet the needs of students, employers, and society.

- *Many Ph.D. recipients are ill-prepared to function effectively in the settings in which they work.* Many new faculty members do not feel ready to carry out the range of roles asked of them, particularly those related to teaching. Ph.D. recipients who work outside the academy struggle to make that transition. In most departments, the most visible and valued career path for doctoral students is into the professorate, even in fields that have historically had many students move into government or industry settings.
- *In most disciplines, women and ethnic minorities are underrepresented among doctoral students.* There seem to be systematic biases in doctoral training that deflect some kinds of students from entering doctoral study, successfully completing it, and entering faculty careers.
- *Doctoral student attrition in many departments approaches (or even exceeds) 50 percent.* This loss of talent is particularly troubling when the decision to leave (by the student or the department) occurs after several years of study. Too many departments do not have accurate records and are unable to discern rates or patterns of attrition.



We began our work on the doctorate at The Carnegie Foundation for the Advancement of Teaching by posing the question: *What is the purpose of doctoral education?*

We propose that the purpose of doctoral education, taken broadly, is to educate and prepare those to whom we can entrust the vigor, quality, and integrity of the field. This person is a scholar first and foremost, in the fullest sense of the term—someone who will creatively generate new knowledge, critically conserve valuable and useful ideas, and responsibly transform those understandings through writing, teaching, and application. We call such a person a “steward of the discipline.” The idea of stewardship is at the heart of The Carnegie Foundation’s work on doctoral education and is explored in the essays collected in this volume.

## The Carnegie Initiative on the Doctorate

In 2001, The Carnegie Foundation undertook a five-year project—the Carnegie Initiative on the Doctorate (CID). The CID is an action and research project focused on aligning the purpose and practices of doctoral education in six disciplines. After elaborating on the idea of stewardship, which is described in more detail shortly, we began the activities of the initiative. With a goal of examining and improving doctoral programs at institutions across North America, the CID works in partnership with departments committed to restructuring their doctoral programs to better prepare their graduates as stewards of the discipline.

### *The CID Project*

The CID focuses its work in six disciplines that span a range of disciplinary areas and traditions.

**THE DISCIPLINES.** Chemistry, education, English, history, mathematics, and neuroscience are the fields on which the CID concentrates. Focusing on a few disciplines allows us to get to know a discipline very well, understand the nuances of the differences between departments and subfields, and appreciate the marked differences among them.

As we considered the many fields where we might concentrate the work of the CID, we took into account several factors. Not only is the knowledge base, by definition, in every discipline different from others but the ways in which knowledge is created and shared are different. Inevitably, then, doctoral education is different among the various fields of study. The history of fields differs: some were part of the academy from the very beginning, such as mathematics or history; others are recent creations, such as neuroscience, women's studies, or computer science. The career paths of graduates may lead nearly exclusively to the academy, as in English, or to a broad range of careers, as in chemistry and education. The size of the enterprise varies: fewer than sixty doctorates are granted per year in classics and nearly two thousand in chemistry. On many other measures—time-to-career, attrition rate, funding patterns, demographic diversity of students, scope and structure of a dissertation—there is considerable variation among the fields.

We deliberately chose fields that grant a sizeable number of doctorates. We also chose these six disciplines because they represent both core liberal arts fields and emergent interdisciplinary fields. They span the humanities, the professions, and the physical and life sciences; only the social

sciences are under-represented, although they are present in some parts of history and education.

**THE DEPARTMENTS.** We selected eighty-four departments that had applied to participate in the CID. Participating departments are committed to designing and implementing doctoral programs that foster stewardship of the discipline. Department members—faculty and students—are engaged in a process of reflection, implementation of program changes, and assessment that will lead to strategies for the creation of stronger doctoral programs, both in the participating departments and in each discipline.

The premise of the CID is that doctoral education will be improved if conversations about the purpose of, mechanisms for, and the particular elements of doctoral education and mentoring become routine and public.

### *Products of the CID*

Throughout the initiative, The Carnegie Foundation and the participating departments are distilling the results of discussions and research and sharing them with the doctoral education and disciplinary communities. The Carnegie Foundation is studying the design experiments and preparing to share the lessons learned in order to catalyze change more broadly. A variety of products will result from the initiative, including models of experimental doctoral programs, research and analysis of the experiments and deliberations, and institutional and policy recommendations.

This book of essays is the first product of the CID. Each of the sixteen essays commissioned by The Carnegie Foundation for the CID addresses one of the six disciplines spanned by the CID. Taken together, the essays in the volume provide opportunities to compare and contrast doctoral education among the disciplines. The essays provide ideas for fruitful practice, a perspective on doctoral education as a larger enterprise, and visions of the possible.

### *Assumptions of the CID*

The CID is an exercise in field building and knowledge building. The strategies of the initiative rest on four assumptions about doctoral education and how to catalyze change in doctoral education:

**GROUND THE WORK IN DISCIPLINES.** As already described, the CID is focusing on six disciplines in order to gain specific understanding and to have a disciplinewide impact. Consequently, we foreground the expertise

of disciplinary leaders and disciplinary societies. The Carnegie Foundation and our educational researchers are given a back seat to the voices and perspectives of leaders in the disciplines. Whether it is the definition of problems or solutions, chemists speak to chemists and historians to historians.

**GROUND THE WORK IN DEPARTMENTS.** Not only do we focus on disciplines but within disciplines we assume that the key educational community is the academic department—the nexus of the discipline and the institution. Some of the institutional characteristics that shape all departments in the institution include financial resources, institutional prestige, geographic location, institutionwide policies, and institutional mission. The discipline also shapes the department, particularly through the shared disciplinary norms, intellectual core, nature of work, and job market of the field. Not only is the department uniquely the product of its discipline and institutional home, it is also molded by its history and current members. The members of the department shape the culture, climate, and lived practices of the department.

Individuals and departments who organize and implement graduate education programs are, for the most part, thoughtful and committed to creating a high-quality education for their students. Nevertheless, program development often takes place without collective deliberation and documentation, and may rely more on tradition than on a shared vision of the purpose of doctoral education. Consequently, the practice of doctoral education advances more slowly than is necessary and can be out of synch with the developmental needs of students.

**IDEAS ARE POWERFUL INCENTIVES FOR CHANGE.** Big ideas are more compelling and more persuasive than either financial incentives or lists of “best practices.” Academics, perhaps more than average Americans, are captivated and moved by important ideas. Puzzles, tensions, paradoxes, visions of the possible, and difficult challenges—all of these motivate and engage the lively and sophisticated minds that make up today’s academic departments. The structure of a doctoral program is a defined set of strategies in service of larger goals: teaching, research, and stewardship. Therefore, thorough discussions of the purpose of doctoral education must be at the heart of efforts to change American doctoral education.

**OTHER DISCIPLINES HAVE MUCH TO OFFER.** We also recognize that there is much that those in one field can learn from another. Here our attention is not so much focused on the kinds of learning that come from

multidisciplinary explorations (where one field learns the tools, techniques, or paradigms of another) but from investigating the same question of making doctoral education as effective as possible. Every field has strategies for doctoral education that serve remarkably well, and other disciplines can learn from these practices.



Given these four core assumptions, our first step was to commission essays for each of the six disciplines on the challenges of doctoral education in that field. The essays speak to doctoral education in that particular discipline and capture the nuances of that field. Written by leading scholars within the field—stewards of their disciplines—the essays focus on ideas, not solely on technical details, and provide valuable models to readers from other fields.

## Charge to the Essayists

Essayists were invited to reconceive or reinvent the forms and structures of doctoral education in their particular discipline. We offered a framing question: If you could start *de novo*, what would be the best way to structure doctoral education in your field?

The idea that the purpose of doctoral education is the preparing of stewards of the discipline raises several related questions:

1. What constitutes knowledge and understanding in the discipline?
2. What is the nature of stewardship of the discipline?
3. How ought Ph.D.'s be educated and prepared?

The essayists also received a longer description of stewardship, similar to the one that follows.

### *Roles and Skills of a Steward*

What does it mean to be a steward of the discipline? Stewardship encompasses, on the one hand, a set of roles and skills, and, on the other, a set of principles. The former ensure competence, and the latter provide the moral compass. Stewardship establishes the purpose of doctoral education.

Regardless of whether or not one sees the doctorate as a professional degree in the strictest sense, there are parallels between the doctorate and the learned professions. The goal of professional education is to inculcate those we educate with the highest levels of competence and integrity.

Upon entry into practice, all professionals assume at least a tacit responsibility for the quality and integrity of their own work and that of colleagues. They also take on a responsibility to the larger public for the standards of practice associated with the profession. Likewise, we believe that Ph.D. recipients bear responsibility for the integrity of their discipline. Just as a lawyer is not only an advocate for clients but an officer of the court, and a doctor is responsible for the health of the patient as well as the health of the commons, so, too, a Ph.D. is a steward of the discipline, not simply a research specialist in one subfield.

The doctorate should signal a high level of accomplishment in three facets of the discipline: generation, conservation, and transformation. A Ph.D. holder should be capable of *generating* new knowledge and defending knowledge claims against challenges and criticism, *conserving* the most important ideas and findings that are a legacy of past and current work, and *transforming* knowledge that has been generated and conserved by explaining and connecting it to ideas from other fields. All of this implies the ability to teach well to a variety of audiences, including those outside formal classrooms.

**GENERATION.** The Ph.D., at its heart, is a research degree. Demonstrating the ability to conduct research and scholarship that make a unique contribution and meet the standards of credible work is the culminating experience of the Ph.D. This accomplishment is traditionally displayed in the dissertation. The Ph.D. signifies that the recipient is able to ask interesting and important questions, to formulate appropriate strategies for investigating these questions, to conduct investigations with a high degree of competence, to analyze and evaluate the results of the investigations, and to communicate the results to others to advance the field.

A steward is expected to conduct investigations according to accepted standards of rigor and quality. Commensurately, she is obliged to read and assess others' work critically, according to these standards, to ensure the quality of scholarly work. This means that a steward not only strives for excellence but also understands how irresponsible work or conduct is identified. For example, in chemistry, good research meets the standard of experimental replicability; researchers share enough data, methods, and results that others can determine the accuracy of conclusions. For historians, scholarly integrity emphasizes triangulation of data sources and the interpretation of primary texts.

**CONSERVATION.** Another facet of stewardship is an understanding of the history and fundamental ideas of the discipline. Disciplines evolve con-



tinuously, and stewards have responsibility for maintaining the continuity, stability, and vitality of the field. Every scholar and steward must strike a balance between mastering breadth and depth in the discipline. Typically, doctoral students learn a small area in great depth, but this deep understanding must be placed in context. Once students understand the historical context of the field—how and when important ideas, questions, perspectives, and controversies arose or fell (or were overturned)—then they can grasp the span and sweep of the field and locate themselves and their work in the disciplinary landscape. Moreover, stewards should understand how their discipline fits into the larger intellectual landscape, have a respectful understanding of the questions and paradigms of other disciplines, and understand how their discipline can speak to important questions.

What constitutes a balanced command of breadth and depth differs by discipline. For example, in physics it requires understanding the prevailing theories and worldviews but does not require more than a passing understanding of prior theories that have been overturned or supplanted. In English, stewards are expected to have a thorough knowledge of the canon broadly construed; the catchphrase “from Beowulf to Virginia Woolf” gives some flavor of the breadth of understanding expected of students before they begin their dissertations.

*Conservation*, as we use the term, is not intended to imply only the preservation of the ideas of the past. It does mean that disciplinary stewards are aware of the shoulders on which they stand and are able to judge which ideas are worth keeping and which have outlived their usefulness.

**TRANSFORMATION.** Knowledge, understanding, and insight have little meaning by themselves. The third facet of stewardship—transformation—speaks of the importance of representing and communicating ideas effectively and clearly. *Transformation* encompasses teaching in the broadest sense of the word. Those who are expert practitioners of their field will be called upon to teach, regardless of their work setting. Whether one is a classroom teacher or is working in a government laboratory, industrial setting, or policy arena, the steward must be able to convey information clearly. Stewards want others to value their knowledge and skills, which requires the ability to communicate effectively to a variety of audiences in oral and written forms.

These audiences include the disciplinary community, the community of those who are formally instructed (ranging in sophistication from graduate students to those taking one introductory course), and society at large. The steward of the discipline has responsibility for transforming knowledge

and communicating to each of these communities, although each may require a different approach.

In many fields, knowledge is also applied: it is generated in the service of problem solving or greater understanding. Stewards have a responsibility to apply their knowledge, skills, findings, and insights. This might be as direct as cleaning up an oil spill or influencing legislation or helping create a museum exhibit. It may include creating and inventing, as well as patenting discoveries.

The idea of transformation also suggests that stewards must understand other disciplines, know the differences between disciplinary views of the world, and be able to appreciate and communicate across traditional boundaries.

### *Principles of Stewardship*

The use of the label steward is deliberately intended to convey a role that transcends a collection of accomplishments and skills. It has an ethical and moral dimension. Definitions of stewardship suggest core principles of stewardship that inform the term steward of the discipline. It calls to mind various historical uses and definitions.

The *Merriam-Webster* online dictionary ([www.m-w.com](http://www.m-w.com)) defines stewardship as “the careful and responsible management of something entrusted to one’s care.” Emphasis is on the idea that one has been entrusted with the care of something valuable on behalf of others. A steward is a forward-looking manager. A steward of the discipline is entrusted with care of the discipline by those in the discipline on behalf of those in and beyond the discipline. Stewardship is a professional responsibility that comes with being accorded professional benefits.

Originally, the steward, or “keeper of the hall,” was the official in a medieval household who was responsible for its management. The *Oxford English Dictionary* (online at [dictionary.oed.com](http://dictionary.oed.com)) defines stewardship as the “conduct of the office of steward; administration, management, control.” The emphasis is on a broad oversight of the whole, comprising many smaller parts and functions. A steward of the discipline thinks broadly about the entire span of the discipline and understands how its constituent parts fit together.

There is an ecclesiastical definition of stewardship befitting the ecclesiastical origins of many universities. The OED says: “The responsible use of resources, especially money, time and talents, in the service of God.” The origin is the Parable of the Talents, in which a man gave three of his servants each some coins to take care of in his absence. Two of the ser-

vants traded with the coins and doubled their holdings; the third was fearful of the master and buried the coins. Those who had taken risks and used the coins were rewarded; the one who had simply saved the money was punished. Here the emphasis is on investing, risk taking, and putting talents (whether coins or abilities) to work, not on hoarding and saving. A *steward of the discipline* considers the applications, uses, and purposes of the discipline and favors wise and responsible applications.

The contemporary environmental movement has adopted the word steward by focusing on sustainable resource management, so that environmental resources will be available for many generations into the future. Here the emphasis is on people living in concert with the environment and on preservation with an eye toward the future. Stewards think into the future and act on behalf of those yet to come. A steward of the discipline, then, thinks about the continuing health of the discipline and how to preserve the best of the past for those who will follow. Stewards are concerned with how to foster renewal and creativity. Perhaps most important, a steward considers how to prepare and initiate the next generations of stewards.

By invoking the term steward, we intend to convey the sense of purpose that guides action. Self-identifying as a steward implies adopting a sense of purpose that is larger than oneself. One is a steward of the discipline, not simply the manager of one's own career. By adopting as a touchstone the care of the discipline and understanding that one has been entrusted with that care by those in the field, on behalf of those in and beyond the discipline, the individual steward embraces a larger sense of purpose. The scale is both temporally large (looking to the past and the future) and broad in scope (considering the entire discipline, as well as intellectual neighbors).

There are conservative aspects to the term, implying the preservation of the past. A steward thinks about how to preserve the heart and essence of the field. But there are also important forward-looking meanings, as stewardship does not imply stasis. A steward is a caretaker who trains a critical eye toward the future. A steward must be willing to take risks and move the discipline forward.

### *Development of Stewards*

We believe that the term *steward of the discipline* should be applied to all doctorate holders. It is not a "Hall of Fame" title reserved for the rare individual who excels in all domains of action.

Instead, stewardship comprises a set of qualities that can be developed; it is not an innate gift. We believe that defining the *development of stewards*

as the purpose of doctoral education reframes the educational mission in a more constructive direction than the current unexamined default that defines success as securing an academic position or tenure. Returning to the analogy of the legal profession, the goal of legal education is to prepare lawyers who serve as officers of the court. Not all lawyers may meet this standard, but no law school aims to prepare ambulance chasers. Only a few lawyers will become officers of the court of the caliber of Learned Hand or Louis Brandeis, but it is a goal to which all should aspire. Not all scientists will be admitted to the National Academy of Sciences nor will all scholars be named Teacher of the Year, but Ph.D.'s can work to balance the roles of generation, conservation, and transformation in ways that serve the discipline with integrity. If all doctorate holders are admitted to the guild of stewards, then it is useful to consider how members can continue to grow and mature as stewards throughout their career.

The most important period of a steward's formation occurs during formal doctoral education. "Generation" has been the most thoroughly developed aspect of doctoral education. Nevertheless, we often do not deliberately consider or explicitly articulate our theories and strategies on the pedagogy of research for developing excellent researchers. Development of the skills, knowledge, habits, and abilities of conservation and transformation is even less systematic.

In reading the essays that follow, it is important to recognize that the formulation of what *stewardship* means is discipline-specific. What it means to be a steward of chemistry differs from, say, English or mathematics. By drafting this general formulation of stewardship, we intend to provide a framework for discipline-specific conversations.

Within a particular discipline, what shape do generation, conservation, and transformation take? How are the various facets of work undertaken with integrity and with the principles of stewardship in mind? What are the responsibilities to the field? How are stewards of the discipline best developed? The preparation of stewards is the central issue of this volume. It was the guiding issue before the essayists whose views make up the bulk of this volume.

## The Essays and Essayists

The charge posed to the essayists was, "If you could start *de novo*, what would be the best way to structure doctoral education in your field?" Essayists were to accept that a key purpose of doctoral education is the development of "stewardship of the discipline." Each author took the spirit of our inquiry and shaped a highly personal answer. This makes the

collection lively and nuanced. The style and format of the essays reflect the habits of mind that are inculcated in each field. The individuality of the essays is one of their great delights.

### *The Essayists*

In each of the six disciplines, we commissioned two, and sometimes three, authors to provide multiple and diverging perspectives. In selecting the essayists, we sought the voices of those with prominence and standing in their field and who had already shown themselves to be thoughtful about doctoral education. Our decision is not without its critics. Indeed, by selecting leading scholars, many of whom are toward the end of their career, we created a collection with a conservative bias.

We do not directly reflect the perspectives of students or newly minted scholars. Arguably, those would be the individuals who most clearly understand the shortcomings of prevailing approaches to doctoral education. Not only does this collection lack a diversity of generational voices, it also reflects a conservative institutional perspective. This betrays not a bias of The Carnegie Foundation but rather the strong prestige and status pressures that continue to operate in American higher education. Whether leading scholars are recruited to a small group of institutions or whether those at the elite institutions are automatically believed to be “leading scholars,” the institutional biases of this collection are clear. The authors are senior faculty members at AAU-member universities. And the constraints of the project meant that only two or three essayists were tapped in each field; consequently, there cannot be adequate subdisciplinary representation. (This is most obvious in history, where three Americanists are writing.) Still, with all these caveats and with all the potential conservatism and complacency that one might expect, the collected essays certainly fill their intended goal of provoking and stimulating.

### *Organization of the Volume*

The sixteen essays at the heart of this volume are organized according to discipline, and each discipline is introduced with a short overview of doctoral education in the field. Before delving into the essays, however, readers will find three commentaries that look across the broad themes of the essays and consider the implications for action. These commentaries consider the implications of the essayists’ ideas for various constituencies. Doctoral education is an enterprise with many stakeholders whose interests sometimes compete and sometimes converge. Putting the concerns of,

in turn, institutional leaders (Ken Prewitt), faculty members (David Damosch), and graduate and postdoctoral students (Crispin Taylor) at the center provides three different lenses for viewing the disciplinary essays.

These overview commentaries follow immediately after this introductory chapter and provide tantalizing glimpses of the essays that we hope will tempt the reader to move well beyond his or her home field. Indeed, in our experience, many readers will find in the offerings from other fields fresh descriptions of familiar problems and new slants on possible solutions.

To help set the larger context and offer further challenges to thinkers and practitioners, an essay on the broad area of the sciences (Yehuda Elkana) introduces the collection of essays.

Working by discipline from science to the humanities, we start with mathematics (Hyman Bass and Tony Chan), then chemistry (Alvin Kwiram, Ronald Breslow, and Angelica Stacy), followed by neuroscience (Zach Hall and Steven Hyman). Education (Virginia Richardson and David Berliner), like neuroscience a multidisciplinary field of study, is next. We follow these with essays from history (Thomas Bender, Joyce Appleby, and William Cronon)—part social science, part humanities—and then English (Andrea Lunsford and Gerald Graff). An essay focusing on the humanities (Catharine Stimpson) follows.

The concluding essay, written by George Walker, the CID project director, poses a number of provocative questions. He invites readers to conduct a “thought experiment”—his model for creating the energy and momentum that help transform ideas into action. He challenges departments, or at least a critical mass of their faculty and graduate students, to engage in serious deliberation and creation of their own vision of the future. This is not easy. It involves looking forward and not being overly concerned with the constraints and obstacles that seem so difficult to overcome.

## Learning from the Essays

The goal of these essays is to start a conversation. We think it terribly important that every graduate faculty and every doctoral student consider, individually and collectively, the purpose of doctoral education and the characteristics of a doctoral recipient. All too often the assumptions are implicit and are never clarified or debated among faculty members; neither are they discussed with or among students. These tacit assumptions can lead to misunderstandings, as well as diffusion of purpose and even contradictory understandings and practices. Our starting questions—What is the purpose of doctoral education? and If you could start *de*

*novo*, what would be the best way to structure doctoral education in your field?—are intended to prompt lively debates.

These essays should provoke. If they do their job, they will unsettle the reader. They call conventional practices into question. Just as often, they affirm conventional practices, which may be equally surprising. They should spark the reader’s imagination and prompt consideration of other disciplines that can provide ideas and grist for the mill.

These essays are the *first* word in a discussion, not the last. They are *not* to be read as definitive proposals or recipes that will be adopted wholesale (although some authors may hope for such a response!). Nor should they be read as position papers advocating the stance of The Carnegie Foundation for the Advancement of Teaching.

### *How to Use the Essays*

The effect of these essays has already been to spark debate and deliberation within a number of the doctorate-granting departments participating in the CID. Their experiences suggest ways to use the essays as part of a class, department retreat, conference panel, student event, or faculty meeting:

- Select a few essays as common starting points. Which points resonated? With which points do you disagree?
- Construct, for your discipline:
  - A list of the shared values of disciplinary practitioners, like the detailed one in William Cronon’s essay;
  - A chart of the crucial elements of scholarly inquiry and student learning, like the one that appears at the end of Virginia Richardson’s chapter;
  - A list of “curricular enhancement” elements and when they should be incorporated into doctoral study, like the one Alvin Kwiram provides;
  - A list of qualities or capacities of the professional who is educated for stewardship of the discipline, like the ones written by Thomas Bender and Hyman Bass.
- Select one or two ideas and conduct a thought experiment: What would the implications be of restructuring our program to incorporate (or eliminate) that feature or requirement? If the ideas come from quite divergent fields, the thought experiment can be friskier: What are the essential features of a “lab” that can translate from chemistry to English? Could one eliminate, or institute, several

years of course work? What would a “contested ideas” course, of the sort proposed by Gerald Graff, look like in mathematics?

- Several authors (David Berliner, Ronald Breslow, Tony Chan, Gerald Graff) provide lists of specific practical suggestions. Can these translate to your department or discipline?
- Organize an introductory seminar for doctoral students around reading and debating the essays. First-year doctoral students have not yet been hardened into the norms and mores of the discipline. What ideas that are taken for granted seem dispensable? Which questions asked in a different discipline have resonance?
- Conduct the four-step thought experiment proposed by George Walker. What visions emerge? What answers to the many questions he poses become apparent?

### *Themes Across the Essays*

One way of appreciating the shared challenges facing doctoral education is by looking at the ways similar problems are framed and resolved. The following ten issues are each discussed at some length in the listed essays (and others give them mention as well). This is not an exhaustive list but gives a flavor of the span of the essays; we hope it will encourage the reader to sample widely in the collection:

- The importance of preparing doctoral students in the art, craft, and science of teaching is addressed by ten of the essayists, who discuss this matter specifically: Appleby, Bass, Breslow, Bender, Chan, Cronon, Graff, Kwiram, Lunsford, and Stacy.
- As Cronon reminds us, “the tendency of all guilds is to turn inward,” and several essayists specifically advocate for an increased emphasis on intellectual breadth and awareness of the larger disciplinary context: Bender, Breslow, Chan, Cronon, Hyman, Kwiram, and Stacy. Indeed, Hyman goes so far as to propose a “functional test” for breadth.
- The question, “Who should the next generation of graduate students be?” as Stimpson phrases it, is addressed by Chan, Lunsford, Stacy, and Stimpson.
- The future of the discipline and the new intellectual problems with which it must contend are challenges (“Grand Challenges,” Breslow calls them) explicitly articulated by Bender, Breslow, Chan, and Hall. Graff’s essay details an important object lesson: it is too



easy to meet new challenges by adding new faculty or new programs; it is much harder to make choices among competing visions.

- Engaging with “large questions and projects,” to use Lunsford’s phrase, whether in “contested issues” courses (Graff) or emphasizing “big ideas” (Berliner) as a way to inculcate students into important disciplinary conversations is included in the essays by Appleby, Berliner, Elkana, Graff, and Lunsford.
- The role and responsibilities of advisers and mentors—an issue often raised by students—is discussed by Bender, Chan, Cronon, Elkana, and Stacy.
- The development of “practical knowledge,” to use Richardson’s label, or “professional skills,” Breslow’s term, in the curriculum and through mentoring, is a specific concern raised by Breslow, Chan, Kwiram, and Richardson.
- The creation, using Stimpson’s words, of “academic citizens, members of a public,” through engagement with policy and practice in the larger world, is addressed by Appleby, Bass, Berliner, Elkana, and Stimpson.
- Richardson calls for inculcating values and integrity, as do Breslow and Kwiram, who focus on ethics.
- The diversity of career paths, or what Hall calls the “recent expansion of professional opportunities,” and the attendant challenge for doctoral programs, is tackled in the essays by Bender, Chan, Graff, Hall, and Stimpson.

Finally, and perhaps most centrally, many of the essayists focus on the challenges involved in preparing excellent researchers. While arguing that most research preparation in U.S. doctoral programs is of high quality, specific challenges emerge: maintaining rigor and quality (Elkana and Hyman), developing independence and creativity (Breslow, Stacy), fostering curiosity (Appleby, Stimpson), addressing the challenges of collaboration (Lunsford), encouraging risk taking (Elkana), making better use of the high stakes and intellectual challenges of problem and project selection (Cronon, Elkana), and understanding the importance and difficulties of working interdisciplinarily (Bender, Cronon, Hall, and Stimpson).

As I said at the start of this chapter, graduate education faces changed circumstances, whether we wish to recognize them and whether our doctoral programs respond to them or not. Globalization of knowledge, as Yehuda Elkana describes most forcefully, is one of these. New practices

may include coauthored dissertations, such as Andrea Lunsford describes, and similar adaptations to the changed ways in which interdisciplinary science is done.

This book articulates many questions regarding the future of doctoral education that have been raised in the last fifteen years and begins to provide some answers to them. Those who take the challenges seriously and deeply can consider the possible strategies suggested by these essayists and will then have the opportunity to create new forms of doctoral education that will truly create stewards of the discipline. The issues are complex, and solutions require deep thinking, hard work, and the goodwill of many people. We are encouraged that so many faculty, students, staff, administrators, and postdocs find these matters worth taking seriously. We invite you to join the conversation.

## Acknowledgment

Before the reader turns to the essays, I want to conclude with a thank you. This volume owes a great deal to Ellen Wert. She served as the editor for each of the essays. A good editor is like a gem cutter. She looks at a diamond in the rough and sees its potential. She works carefully, but with a sure hand, to help the sparkling essence emerge. She both shapes and polishes. Ellen's light touch, deft editing suggestions, and deep knowledge of doctoral education allowed the core ideas of each author to shine. We are greatly indebted to her for making this collection a set of jewels.

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