ASSOCIATION FOR INTEGRATIVE STUDIES
NEWSLETTER

Volume 27, Number 3 (October 2005) ISSN 1081-647X William H. Newell, Editor

Teleconference to discuss state of IDS today

"Interdisciplinary Studies: Where Are We Today" will take a look at the present state of interdisciplinary studies and offer participants the opportunity to pose their questions to a panel of leading scholars.

The Association for Integrative Studies will present the 2005 teleconference via satellite and webcast from 1 to 3 p.m. EST, Thursday, Nov. 10.

Incoming AIS President Don Stowe cites the prevalence of discussions

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Mapping the Past for the Future:

Klein tracks long-term evolution of IDS in U.S.

Julie Thompson Klein. (2005). *Humanities, Culture, and Interdisciplinarity: The Changing American Academy*. Albany, NY: State University of New York Press.

Reviewed by Carolyn Haynes, Professor of Interdisciplinary Studies, Director of the Honors and Scholars Program, and Special Assistant to the Provost for Academic Planning, Miami University, Oxford, Ohio.

At the last AIS conference in Charlotte, I recall a group of us discussing the fact that many of the founding and most active members of Association for Integrative Studies are regrettably moving into retirement, making way for a new generation of interdisciplinarians to define the future contours of interdisciplinary scholarship, teaching and learning and, by extension, the future mission and purpose of AIS. As someone who eagerly intends to participate in the next generation of interdisciplinary activity, I privately bemoaned the probability that without the wisdom and input of those founding members, it would be difficult for younger scholars and teachers not to fall prey to old mistakes.

Fortunately, Julie Thompson Klein's new book, *Humanities, Culture and Interdisciplinarity: The Changing American Academy*, has emerged to provide a valuable resource for advancing the field of interdisciplinary studies. Her work offers its readers a wonderfully rich, intricate and dynamic map of interdisciplinarity and how it has evolved in the U.S. academy since the founding of Harvard College in 1636. Although Klein focuses predominantly on interdisciplinarity within, or in relationship to, the ideas of the humanities and culture, her analyses and conclusions provide vital insights for interdisciplinary scholars and practitioners from all cognate areas and research interests. In fact, as a result of its ambitious scope and its form of analysis and the comprehensiveness of its research, *Humanities, Culture and Interdisciplinarity* marks a watershed moment in the history of the professional literature on interdisciplinarity.

Although, as Klein explains in her book, the roots of interdisciplinarity extend back to the "tradition of the American college, the *studia humanitatis* of the Renaissance, the *humanitas* and *artes liberals* of ancient Rome, and the *paideia* of ancient Greece" (13), the history of the professional literature on the field of interdisciplinary studies is quite brief, dating back less than thirty years. Yet, the history of this literature has already undergone key shifts. The first period which roughly lasted from 1979-1990 and included Klein's first book, *Interdisciplinarity: History, Theory and Practice* as well as other key articles (Newell & Green; Kocklemans; Hursh, Haas & Moore), was devoted to defining interdisciplinarity and articulating a common vocabulary, a shared process of inquiry, and a given set of assumptions about interdisciplinary practice. Because interdisciplinarity was just gaining visibility within the academy, a host of articles also emerged during this first phase that either debated or blatantly attempted to justify the merits of interdisciplinary approaches to learning (Geertz; Fish; Benson; Newell, "The Case").

Since 1990, the bulk of the professional literature on interdisciplinarity has focused less on justifying IDS and more on developing a canonical set of key readings and theories on interdisciplinarity (Newell, *Interdisciplinarity*), responding to concrete problems, or offering theories or information that address specific practical topics. During this second stage, an edited volume of interdisciplinary pedagogical approaches (Haynes), a book on interdisciplinary general education courses

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(Seabury), a guide to interdisciplinary resources (Fiscella and Kimmel), a book on team-teaching (Davis), directories of interdisciplinary undergraduate and Ph.D. programs (Edwards; Szostak), a study of interdisciplinary faculty (Lattuca), and textbooks on interdisciplinary studies (Augsburg; Repko), among many others, have been published. Klein herself co-edited with William Doty a 1994 handbook on the interdisciplinary curriculum and then later edited an examination of interdisciplinary issues from kindergarten through college which are both regularly referenced. These second-stage works have been crucial in establishing interdisciplinary studies as a viable field of study and in providing faculty and administrators with much needed tools for implementing interdisciplinary programs and courses.

In the past decade, however, Klein's work has diverged from the prevailing "pragmatic" trend of the professional literature and ventured down a more pioneering and arduous path. Beginning with her 1996 work, *Crossing Boundaries: Knowledge, Disciplinarities, and Interdisciplinarities*, and continuing into this current book, Klein has undertaken an ambitious agenda: to construct a conceptual and historical framework for understanding, studying, and supporting interdisciplinary practices. To do this, she has not simply relied on the visible works on interdisciplinarity cited above, she has confronted the awesome task of poring through hundreds of historical and current works from disconnected fields and disciplines to pinpoint and collate hidden and overt discussions of integrative or interdisciplinary practice. In *Humanities, Culture and Interdisciplinarity*, Klein has mapped out a vast interdisciplinary genealogical landscape. Because her landscape is so unique and huge, the traditional mapping metaphor seems inadequate. A map is generally viewed on a static, two-dimensional paper surface, but Klein continually underscores the fluid, interactive and dynamic quality of her objects of study. Moreover, a map generally fixes on a specific moment of history, but Klein's mapping process spans several centuries. Hence, what emerges from her study is a multi-dimensional, mutable, multi-colored, multi-textured map that spans both space and time and that continuously evolves.

Klein's book is divided into three major parts. The first part begins with the origins of the generalist model of education which emerged in the colonial colleges and was challenged in the nineteenth century by a movement drawn from the German research university model and emphasizing the importance of specialized disciplinary knowledge. The "generalist" trend, however, did not disappear. Rather, human or cultural knowledge and the "responsibility for 'eternal truths' and an aestheticized study of civilization" became the purview of a group of academic humanists; and by the early twentieth century (24), these concerns found their home in the new general education core curricula developed at several key universities, including University of Chicago and Dartmouth. The early twentieth-century humanists involved in the general education movement sought a holistic, shared or unifying educational experience for their students, in an effort to counter the academy's increasing emphasis on disciplinary knowledge.

By the mid-twentieth century, the demographics of the college student body and faculty as well as the gradual importation of European critical theories began to transform the generalist humanities tradition. Grand unifying explanatory frameworks and notions of essential truths were being questioned, and the influx of women and students of color gave rise to alternative structures of knowledge, critical perspectives on the disciplines, and unique approaches to scholarship and teaching. Literary studies spearheaded these shifts and turns; its focus on universal human values and civilization was supplanted by a cultural studies emphasis that celebrated a heterogeneity and plurality of canonical and non-canonical texts as well as undertook critical analysis along ideological and historical lines. A few traditionalists, however, assumed a defensive posture, decrying the loss of a common culture.

This progression from unity and universality toward heterogeneity and plurality, which was fueled by critical theory and multiculturalism, occurred not only in literary studies but also in numerous other humanities disciplines. Part II of Klein's book analyzes the interdisciplinary trajectories of three major humanities disciplines: literature, art history and music. The maps that she sculpts for each of these disciplines possess similar contours. Formalized in the last nineteenth century, each of the three disciplines Klein examines tended to stress historical periodization and a canonical master narrative. Scholars in these disciplines typically analyzed the formalistic components of their objects of study and worked to classify and identify ontological and formal differences among various time periods. Some comparisons were made among texts and objects.

By the mid or later twentieth century, historical empiricism as well as traditional formal style analysis gave way to deconstructionist, feminist, semiotic or other critical approaches. New scholarly approaches to literature, art history or music critiqued universal interpretations that ignored differences of power, race, gender or class; new hybrid genres or approaches such as performance art, language poetry, surrealism or jazz studies were invented; and in each of these discipline, a new awareness of a distinctly American approach developed. In the past two decades, all three of these disciplines began examining works by women, people of color as well as individuals outside of Europe and the U.S., and scholarship began to focus on music, art or literature within a social, historical, political and global context. All of these disciplinary transformations happened abruptly, but Klein, drawing from the work of Mieke Bal, points out that these shifts do not signify a crisis. In fact, they "actually highlight an 'astonishing vitality'" (114) of growth, experimentation and passion for integration.

Part III of *Humanities, Culture and Interdisciplinarity* focuses not on disciplines themselves but on the dynamic growth and development of three interdisciplinary fields, each of which centers itself on U.S. culture: American Studies, African American Studies and Women's Studies. Because it is the oldest of the three fields and arguably gave birth to the subsequent fields of African American and Women's Studies, Klein's

analysis begins with American Studies. The map she draws of each of these three fields bears some striking similarities to the maps of the three humanities disciplines discussed in Part II. Developed in the 1930s, American Studies scholars focused on the New England tradition and later adopted what came to be known as the "myth and symbol" approach. They identified connections among creative and popular culture objects and promoted harmonious interpretive linkages. Despite this shared approach, these early American Studies scholars lacked a coherent theory, method, or technique.

As in the case of the previously discussed disciplines, American Studies underwent profound transformations from the 1970s through the 1990s, mostly as a result of the rising popularity of the cultural studies approach. Not only did the field broaden its understanding of textuality, but it also adopted a more transnational and global focus. As with music, art history, and literature, boundary crossing—in terms of genre, audience and disciplinary codes and conventions—became more accepted, and the general conceptualization of American culture became more particularized to various ethnic, racial or gendered groups. In fact, the awareness that U.S. culture varies among different identities helped to vitalize two new interdisciplinary fields: African American and Women's Studies.

Because the subject matter and participating members of African American and Women's Studies represented identities on the margins of U.S. culture, the scholars and practitioners in these two fields tended in the early period of the 1960s and 70s to relate their work to political and social activism. Yet, as more scholars and teachers joined these fields, they quickly saw a need to assert disciplinary legitimacy and to become institutionalized in the academy. As a result, the scholarship in these two fields became more academic and scholarly in tone, at times abandoning their more pragmatic and activist agendas; and it more recently began connecting the U.S. experience with the rest of the world.

Besides undergoing major transformations during the last fifty years as a result of demographic changes in the U.S. population and the prevalence of new critical theories, all of the disciplines and fields Klein examines have steadily moved toward various forms of integration. In literature, for example, borrowings from and collaborations with other disciplines such as philosophy, anthropology, linguistics and psychology have spawned new integrative topics and approaches, including "the history of the book, the materialism of the body, psychoanalysis of the reader, the sociology of conventions, and the ideology of gender, race, and class" (93). Art historians have shifted attention away from intrinsic properties of discrete visual domains and "toward a systematic interrogation of the ways art forms emerge, circulate, and are intertwined within a culture" (122); new interdisciplinary fields such as visual studies, media studies, and film studies have also been spawned. Similarly, music has expanded its focus to encompass sociological and historical understandings; as a result, exciting new integrative fields such as jazz studies and "interdiscursive" approaches to opera have gained currency.

But how interdisciplinary are these recent efforts made in the humanities? In chapter 3, "Forging Theory, Practice, and Institutional Presence," Klein reminds us of the definition of interdisciplinarity which she and Bill Newell developed in 1997 and which is now commonly cited in the professional literature: the integration of "separate disciplinary data, methods, tools, concepts, and theories in order to create a holistic view or common understanding of a complex issue, question, or problem" (55; see also Klein and Newell 393). She also goes on to explain that the use of the word, "holistic," in this definition does not necessarily imply imposing a new unity or inventing a new super-discipline. For her, interdisciplinarity entails a serious commitment to disciplinary knowledge as well as a conscious triangulation of depth (competence in pertinent disciplinary, professional and interdisciplinary approaches), breadth (the ability to work with and comprehend multiple perspectives), and synthesis (the capacity to put together different parts). The shape, size and texture of this triangulation process is "determined by the particularities of the task, the participants, the resources that are available, and the ultimate goals" of the project (66).

If Klein's definition of interdisciplinarity is used as lens for analyzing the interdisciplinary trajectories of the humanities disciplines and fields examined in this book, then clearly there is considerable room for improvement. Many of the interdisciplinary efforts in the humanities veer toward "bricolage," or an "eclectic mix of concepts, methods, and terminology" (66) and fail to achieve synthesis. Although some humanists have called for what Arthur Kroker has deemed a "critical interdisciplinarity" (57) which would dismantle the boundaries between the humanities and the social sciences, question the assumptions behind dominant disciplinary practices, defy universalist metanarratives, and treat cultural objects relationally and contextually, often those attempting to take this approach end up developing new synthetic critical discourses which are totalizing in their own right. Moreover, some of the more seasoned interdisciplinary fields, such as American Studies or Women Studies, have "congealed" to the point that they have a shared epistemological base, journals, and departments and thus now function as disciplines (69). Finally, in terms of infusing interdisciplinarity into the curriculum of the academy, a "complete transformation has not occurred" (215). Most of the efforts on campuses remain in the earlier developmental stages. Klein notes, "interdisciplinarity continues to exist more at the level of the student, and disciplines dominate in upper-division and graduate training, leaving fields reliant on cross-listed courses" (201).

Despite these concerns, Klein remains optimistic and fascinated by the continuous fluctuations, creative inventions and tenacity of the humanities. For her, interdisciplinarity will undoubtedly continue to flourish and evolve in the humanities not only because it is the best way to respond to "the new conditions of knowledge and culture" but also because it has always been an endemic part of the history of the humanities. *Humanities, Culture and Interdisciplinarity* is to be commended for its ability to map what defies mapping: the intricate interrelationship

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Interdisciplinary Research in Science and Technology:

National Reports Give Evidence of Changing Dynamics

By Julie Thompson Klein, Wayne State University

In 1991, authors of a mammoth study of *Federally Funded Research* in the United States declared that "Research in general is becoming increasingly interdisciplinary" (224). The recent appearance of a major report from the National Academies on *Facilitating Interdisciplinary Research* marks a threshold point in science and technology. Over the latter half of the twentieth century, the profile of interdisciplinary research (IDR) heightened and it attained a new plurality evident in the report's opening examples. Many key topics today are interdisciplinary, prominent among them nanotechnology, genomics, bioinformatics, neurosciences, conflict, and terrorism. Many significant accomplishments are products of interdisciplinary inquiry and collaboration, including discovery of the structure of DNA, the Manhattan Project, laser eye surgery, human genome sequencing, the "green" revolution**,** and human space flight. Generative technologies such as magnetic resonance imaging are also enhancing research capabilities in many fields through the development of new instrumentation and informational analysis (17).

Authors of the report highlight four powerful drivers of IDR today:

> (1) the inherent complexity of nature and society,
>
> (2) the desire to explore problems and questions that are not confined to a single discipline,
>
> (3) the need to solve societal problems,
>
> (4) the power of new technologies. (2)

The current heightened momentum is also linked historically with international economic competition in the 1970s in science-based technologies. The National Science Foundation (NSF) responded with new funding programs aimed at strengthening U.S. science and technology. Over the past two and a half decades, programs such as the University-Industry Cooperative Research Centers, Engineering Research Centers, and Science and Technology Centers have made collaboration, competitiveness, problem solving, systems, complexity, and interdisciplinarity new keywords in academic research.

Throughout the period, the National Academies Press has continued to publish numerous reports that track the expansion of IDR and continuing impediments. The 1986 *New Alliances and Partnerships in American Science and Engineering* and Sproull and Hall's 1987 *Multidisciplinary Research and Education Programs in Universities* were both affiliated with the Government-University-Industry Research Roundtable, created in 1984 as a forum for multiple stakeholders to explore jointly the productivity of the U.S. research enterprise. The Roundtable was sponsored by three of the four advisory groups that constitute the National Academies in the U.S.: the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. Beyond more familiar structures such as centers, institutes, and research parks, the new models and alliances include offices of technology transfer and industrial liaison programs, joint mergers and commercial ventures, research networks and consortia, contract research, and entrepreneurial firms that offer services or manufacture products. All of the activities that occur are not interdisciplinary, but research is typically problem-focused and often collaborative. Innovations in product design and the knowledge produced in these facilities also utilize new ideas and methods born at the interfaces of traditional disciplines. At the time of the two reports, the areas attracting the greater attention were advanced engineering materials and methods, computer sciences and complex systems software, molecular biology, and biomedical specialties.

The expanding profile of IDR has implications for the disciplines as well. In 1972 the National Research Council (NRC), the fourth advisory group in the National Academies, declared there was "no definable boundary" between physics and other disciplines (*Physics in Perspective 67*). In a subsequent report, the 1986 volume *Scientific Interfaces and Technological Applications*, NRC highlighted new disciplines arising from the interfaces of physics and other sciences plus applications in technology, medicine, and national defense. Almost all significant growth in recent decades, the Panel on Scientific Interfaces and Technological Applications explained, has occurred at "the interdisciplinary borderlands" between established fields. The five prominent areas in fundamental research are biological physics, materials science, the physics-chemistry interface, geophysics, and in mathematical physics and computational physics. The six outstanding areas of technical applications, which are pivotal to large-scale industrial technology, are microelectronics, optical technology, new instrumentation, the fields of energy and environment, national security, and medical applications. In each area, the Panel offered recommendations aimed at facilitating interdisciplinary research and improving educational preparation.

In 1990, the National Academies Press published another NRC-affiliated report on *Interdisciplinary Research: Promoting Collaboration Between the Life Sciences and Medicine and the Physical Sciences and Engineering*. A joint activity of the Institute of Medicine's Division of Health Science Policy and the Board on Physics and Astronomy, the report sought to bridge gaps in communication between the cultures of physical sciences, engineering, biology, and medicine. New intellectual understandings of biological systems, problem complexity, the costs of instrumentation and facilities, and the desire to transfer knowledge rapidly from laboratory to hospital and marketplace are driving forces propelling collaboration.

This report highlights the role of scientific and technological developments in diagnostic instrumentation, medical devices, drug design, synthetic and genetically engineering biological materials, and new tools of quantitative and computer-assisted mathematical analysis in the practice of clinical medicine and surgery and on disease prevention and health. Despite the momentum, though, impediments continue to slow the pace of change. The report offered detailed suggestions for facilitating interdisciplinary collaboration and easing impediments in university and teaching hospital structures as well as academic-industrial interactions. It also commented on the role of federal funding agencies and private foundations.

Facilitating Interdisciplinary Research

Facilitating Interdisciplinary Research is the latest and most comprehensive report on IDR published by the National Academies Press. Issued in November 2004, it is framed by the widening impact of activities tracked in previous reports and new developments. The report emanated from a partnership of the National Academies and the W.M. Keck Foundation aimed at stimulating new modes of inquiry and breaking down conceptual and institutional impediments in science, engineering, and medical research. The invited members of a Committee on Facilitating Interdisciplinary Research represented a cross-section of governmental, academic, and industrial experience in leading and performing interdisciplinary research. They were charged with studying the current nature and extent of IDR; identifying and analyzing structural models and the policies and procedures of Congress, funding organizations, and academic and non-academic institutions; identifying measures to evaluate impact on research, students, and researchers; addressing enabling and impeding factors; and presenting their findings and recommendations. The report draws from their literature review, interviews with leading scholars, focus groups held at a National Academies Keck Futures Initiative Conference, input from invited speakers and participants at a January 2004 conference at NAS headquarters in Washington, D.C., and surveys of convocation participants, individuals who responded to an instrument posted on the Committee's website, and a third instrument distributed to provosts or vice-chancellors in selected institutions.

The report is divided into ten sections. After the opening Executive Summary, Chapter 1 provides an "interdisciplinary vision" and describes where the research community has been in the past and is now going. Chapter 2 presents a definition of IDR, discusses the four driving forces, and explores the nature of successful interdisciplinary work. Chapter 3 features case studies and strategies in industry and government laboratories. Chapter 4 describes the current working environment and challenges for students and academic researchers. Chapter 5 discusses institutional barriers to and policies supporting interdisciplinary research, education and training. Chapters 6 and 7 address respectively the roles of federal and private funding organizations, and of professional societies. Chapter 8 ponders the challenges of evaluating interdisciplinary outcomes in research and teaching. Chapter 9 looks at the overall structures in which IDR takes place and proposes incremental as well as transformative policies. Chapter 10 synthesizes the Committee's findings and recommendations. The eight appendixes contain support documents, including a short essay on how some "interdisciplines" have evolved into disciplines and results of the survey of institutions and individuals, interviews, and focus groups.

Funding agencies play a vital role in facilitating IDR. The Committee urges both private and public funding organizations to develop more favorable policies and structures, including interagency cooperative activities and revised proposal and review criteria. Funding agencies are already keenly aware of the changing landscape of knowledge. The National Institutes of Health (NIH) Roadmap for medical research was a major example at the convocation and in the report. The NIH Roadmap recognizes that collaborative teams and new combinations of skills and disciplines are increasingly needed to deal with research problems effectively. Propelled by recent discoveries in molecular and cell biology, the complexity of biology requires a better "toolbox" to understand the combination of molecular events that lead to diseases such as cancer. Improved technologies, databases, and computational infrastructure are key to viewing and interacting with basic life processes. Hence, molecular imaging, bioinformatics and computational biology, and nano-medicine loom large in the contemporary interdisciplinary expanse of biological and medicine sciences (http://nihroadmap.nih.gov/interdisciplinary/grants.asp).

The National Science Foundation (NSF) was also represented at the convocation and in the report. In a separate April 2004 report, *National Science Foundation: Governance and Management of the Future*, the agency highlighted efforts to reshape its processes, structures, and incentives in order to stimulate interdisciplinary and innovative research. The system of "Crosscutting" programs includes interdisciplinary initiatives and programs supported by multiple Directorates at NSF and jointly with other Federal agencies. Current models include the Integrative Graduate Education and Research Traineeship (IGERT), Innovation and Organizational Change (IOC), Information Technology Research (ITR), Major Research Instrumentation Program (MRI), Partnership in Nanotechnology (NANO), Partnership for Innovation (PFI), and Science and Technology Centers: Integrative Partnerships STC). The Knowledge and Distributed Intelligence (KDI) Funding Initiative was also created to find ways to model and use computer and cross-disciplinary scientific data.

Facilitating Interdisciplinary Research also urges that comparative evaluations of research institutions, such as the National Academies assessment of doctoral programs and activities that rank university departments, become more inclusive of interdisciplinary. Here too, key groups are already alert to the need for change. When a separate committee was charged with examining the methodology used in the 1995 National Research

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Council's study of Research-Doctorate Programs in the United States, it faulted the study for outdated or inappropriate taxonomy of fields. In proposing a new taxonomy, the committee recommended an overall increase in the number of recognized fields from 41 to 57. Among their recommendations, they proposed that biological sciences be renamed life sciences, and that agricultural sciences be included. In addition, they called for greater inclusion of subfields to acknowledge the density of activities in complex fields as well as greater recognition of emerging fields. Primary examples include knowledge production by and about underrepresented groups, evident in feminist, gender, and sexuality studies. They also include expanding global area studies as well as nanoscience, bioinformatics, and computational biology. No less significant, the Committee found that the problem of naming arises in all fields. Despite general agreement that interdisciplinary research is widespread, doctoral programs often retain traditional names (Ostriker and Kuh).

Despite the current heightened momentum for IDR, researchers still encounter a host of obstacles and disincentives that are familiar from earlier reports. Some take the form of personal communication or "culture" barriers. Others are related to the tradition in academic institutions of organizing research and teaching by discipline-based departments, perpetuating disincentives throughout the system of budget, administrative report lines, recruitment and hiring, promotion, and tenure. Even with changes at NIH, NSF, and other public and private agencies, that tradition is mirrored in the peer-review process and resource allocations. The Committee urges professional societies to facilitate IDR by producing state-of-the-art reports on recent research developments, curriculum, assessment, and accreditation methods in their respective disciplines and fields, as well as publishing interdisciplinary journals and special editions of disciplinary journals, hosting special forums at regular meetings, launching targeted initiatives, and generally promoting mutual understanding of disciplinary methods, languages, and cultures. Industrial and national laboratories can furnish valuable insights into establishing matrix structures for problem-oriented research, establishing leadership models, and utilizing proven strategies for managing collaborative teamwork.

Education and training play a particularly crucial role in the long-term prospects for IDR. While providing examples of innovative practices, the Committee exhorts the academy to create more opportunities for undergraduates as well as graduate students and postdoctoral scholars. Two other documents published by the National Academies Press also depict innovative structures and strategies. The 2003 NRC-affiliated report *BIO 2010: Transforming Undergraduate Education for Future Research Biologists* offers a blueprint for bringing undergraduate education in biology "up to the speed" of contemporary research. The authors call for a strong interdisciplinary curriculum that integrates physical sciences information technology, and mathematics with life sciences, while decreasing administrative and financial barriers to cross-departmental collaboration. Case study boxes highlight model courses and approaches across North America, and the body of the report includes detailed recommendations for key concepts and skills, curriculum models, textbooks and teaching materials, and innovative pedagogy. In addition, Pellmar and Eisenberg's 2000 committee report on *Bridging Disciplines in the Brain, Behavioral, and Clinical Sciences* includes models of interdisciplinary teaching and training at all levels, from undergraduate and pre- and post-doctoral training to career education.

Throughout *Facilitating Interdisciplinary Research*, a host of text boxes highlight innovative practices, organizational structures, and institutional policies. "Toolkits" illustrate how proposals, individuals, funding organizations, centers, and research outcomes can be evaluated. Case studies present a variety of programs and practices in industry, national labs, and academic settings in North America and abroad. Sample models and lessons also appear in individual chapters. Like all reports, *Facilitating Interdisciplinary Research* has limits. There are holes in the literature review, undermining the Committee's claim of being hampered by a lack of recent published information on models, policies, and answers to questions about which areas should be strengthened and what technologies and instruments are most likely to generate new fields and subfields. The strategy of "best practices" also tends to privilege elite models, and the research base is not a longitudinal empirical study. Nonetheless, this report is a valuable tool for campuses embarking on or already engaged in efforts to facilitate interdisciplinary research. It is an authoritative snapshot of what is happening nationwide and a "must read" discussion piece.

In his comparative international study of research and advanced education in modern universities, Burton Clark stated the challenge that all research universities face. Modern systems of higher education are confronted by a gap between older, simple expectations and complex realities that outrun those expectations. Definitions that depict one part or function of the university as its "essence" or "essential mission" only underscore the gap between simplified views and new operational realities that are transforming the way we think about knowledge and education (154-55). *Facilitating Interdisciplinary Research* portrays the new reality of interdisciplinary research and provides resources for responding.

***Facilitating Interdisciplinary Research* (2004) is 332 pages long and may be ordered online from the National Academies Press, with a discount for online orders (http://books.nap.edu/catalog/11153.html). The hard-copy paperback is $42.00, and the web version is $37.80 (ISBN 0309094356). The price of the paperback and PDF is $45.50 (0-309-54729-6). The price of the PDF book is $28.50 (0-309-54727-X) and individual PDF chapters $2.70 each. (0-309-54728-8). Chapters may also be skim read online without charge.**

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of these three ideas and approaches. For interdisciplinarians, it offers lessons from the past that are still useful, reminds us of mistakes to be avoided, and highlights gaps to be filled. It is remarkable for the sheer scope of its analysis and the in-depth and broad nature of its research. As such, it is a "must read" for those of us committed to the vitality and future of interdisciplinary studies.

Only Klein could amass and combine the voices of every important thinker who has uttered wisdoms about interdisciplinarity in such a lucid, coherent way. This strength, however, also points to some future needs in the professional literature on interdisciplinarity. Klein relies entirely on secondary sources, and she notes at one point that there are few studies that examine the actual work of interdisciplinary humanists or assess the effectiveness of the interdisciplinary endeavor (67). Clearly, empirical research on interdisciplinarity is needed, and although Klein weaves in many diverse voices to advance her analysis, the voices of students are omitted in this book and in the interdisciplinary professional literature in general. The mark of a strong work, however, is that it prompts readers to see beyond the horizons of the book and to imagine a future landscape of study and learning. Klein not only has illuminated the past, she has compelled us to venture gallantly into the future.

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IDS Teleconference ...

(continued from page 1)
about interdisciplinary studies.

"Everyone talks about interdisciplinary studies, using a variety of related terms such as interdisciplinarity, interdisciplinary programs, interdisciplinary general education, and interdisciplinary collaboration. Presidents, provosts and deans extol the virtues of interdisciplinary studies in their speeches and strategic plans. National reports document the increased research and curriculum initiatives, and the literature on assessing the outcomes of interdisciplinary learning has grown in recent years."

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Teleconference Panel

Julie Thompson Klein, Professor of Interdisciplinary Studies at Wayne State University in Detroit, Michigan, is an internationally respected authority on interdisciplinary research, education and problem solving.

Carolyn Haynes is Professor of Interdisciplinary Studies at Miami University, Oxford, Ohio. She also serves as Director of the Honors and Scholars Program and as Special Assistant to the Provost for Academic Planning.

William H. Newell is Professor of Interdisciplinary Studies at Miami University, Oxford, where he was a charter member of the faculty in 1974. He was the founding President of AIS in 1979, and he served as Secretary-Treasurer and Newsletter Editor from 1983 until his appointment as Executive Director in 1991.

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