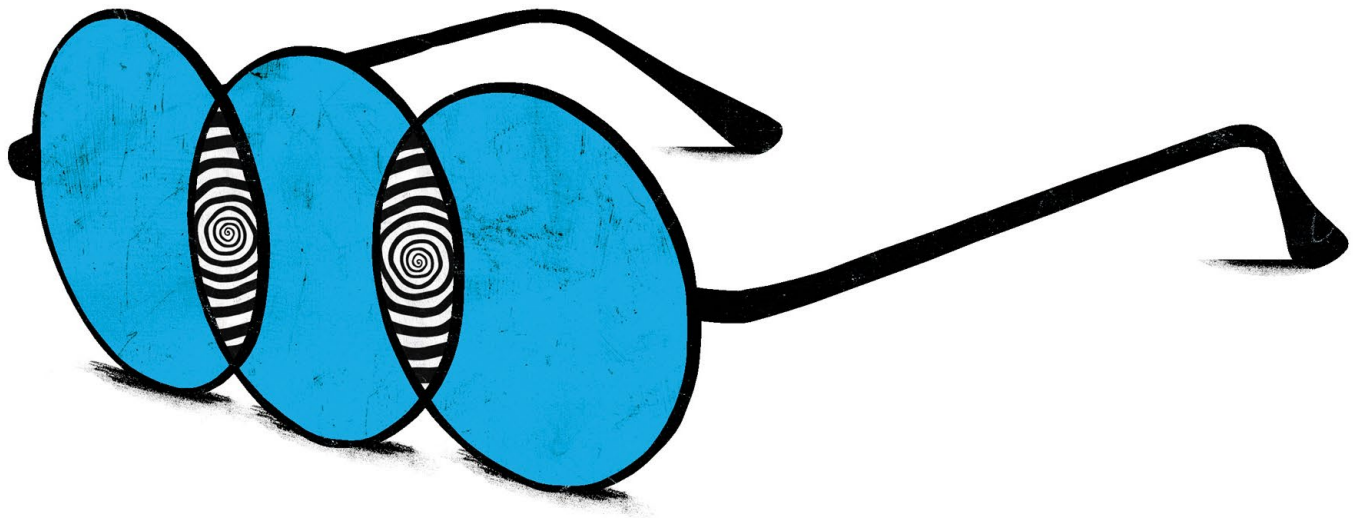


THE CHRONICLE
OF HIGHER EDUCATION

21st- Century Research

Crossing the Disciplinary Lines



With
Support
From



TEXAS A&M
UNIVERSITY



TEXAS A&M
UNIVERSITY®

When great minds come together for a combined purpose, truly amazing things can happen. That is the fundamental notion behind interdisciplinary research, and universities around the globe are increasingly using this strategy to tackle the world's greatest challenges.

Texas A&M University, with annual research expenditures nearing \$1 billion, is one of 65 members of the Association of American Universities. We want to ensure we are good stewards of our resources, advancing research and innovation for the greatest benefit to our global society.

Interdisciplinary collaboration is one of the most powerful tools we have in academia. That is why at Texas A&M we are focused on motivating and equipping our faculty members to conduct research across disciplines. We have deployed a variety of methods to encourage collaboration, one of which is cluster hiring.

Rather than hiring individual faculty members per subfield, cluster hiring is a strategy whereby multiple positions are filled by candidates from diverse fields who share research interests but use different approaches. Ideally, this hiring method results in research teams with complementary expertise that synergistically advance the capabilities of all of the parties involved.

So is the case with a cross-college initiative at Texas A&M targeting spinal cord injury, which will be detailed in one of the articles that follows. This exciting venture brings together world-class scientists from a variety of disciplines who are all highly motivated to improve the lives of those who have been affected by this devastating injury, as well as their families. We are so proud that such an important and promising endeavor is taking place on our campus.

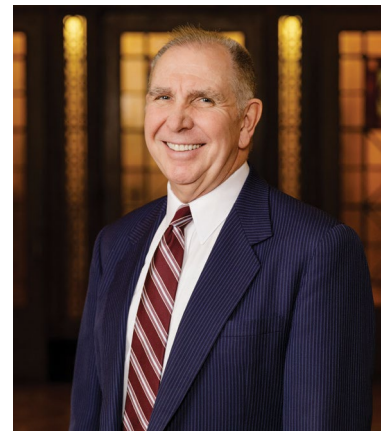
We are pleased to be sharing our story and interested to learn about cluster hiring initiatives at other institutions of higher learning. Thank you for reading.

Sincerely,

A handwritten signature in black ink that reads 'Michael K. Young'.

MICHAEL K. YOUNG

Texas A&M University President



“Interdisciplinary collaboration is one of the most powerful tools we have in academia.”

— President Michael K. Young

21st-Century Research

Crossing the Disciplinary Lines

In recent years, a new trend, some say movement, has swept through higher education. Dozens of universities have started efforts to better align research to solve real-world problems. A key part of this is getting faculty members to work across academic specialties.

Institutions have built new buildings to spur interdisciplinary thinking, revamped incentive structures to reward collaboration, and hired groups, or clusters, of researchers to focus on issues that cut across traditional departments.

Many in academe applaud such changes, arguing that pressing problems like climate change or global terrorism don't fit neatly inside a single discipline. Others, however, disagree, saying that the push for interdisciplinary approaches may actually hurt higher education.

This collection of *Chronicle* stories and opinion articles analyzes how university research is changing, as well as the opportunities and potential pitfalls of interdisciplinary work.

4 Breaking Down Barriers Across Disciplines

Some campuses have found ways to grease the wheels of collaboration.

7 Rethinking Funding Structures

The way the government pays for science doesn't necessarily incentivize problem-solving.

10 Buildings That Foster Collaboration

New campus spaces are meant to push interdisciplinary studies.

13 The Promise and Peril of Cluster Hiring

It can bolster interdisciplinary work. But consult faculty members each step of the way.

18 Can a University Save the World?

A new movement seeks to find out.

21 The Interdisciplinary Delusion

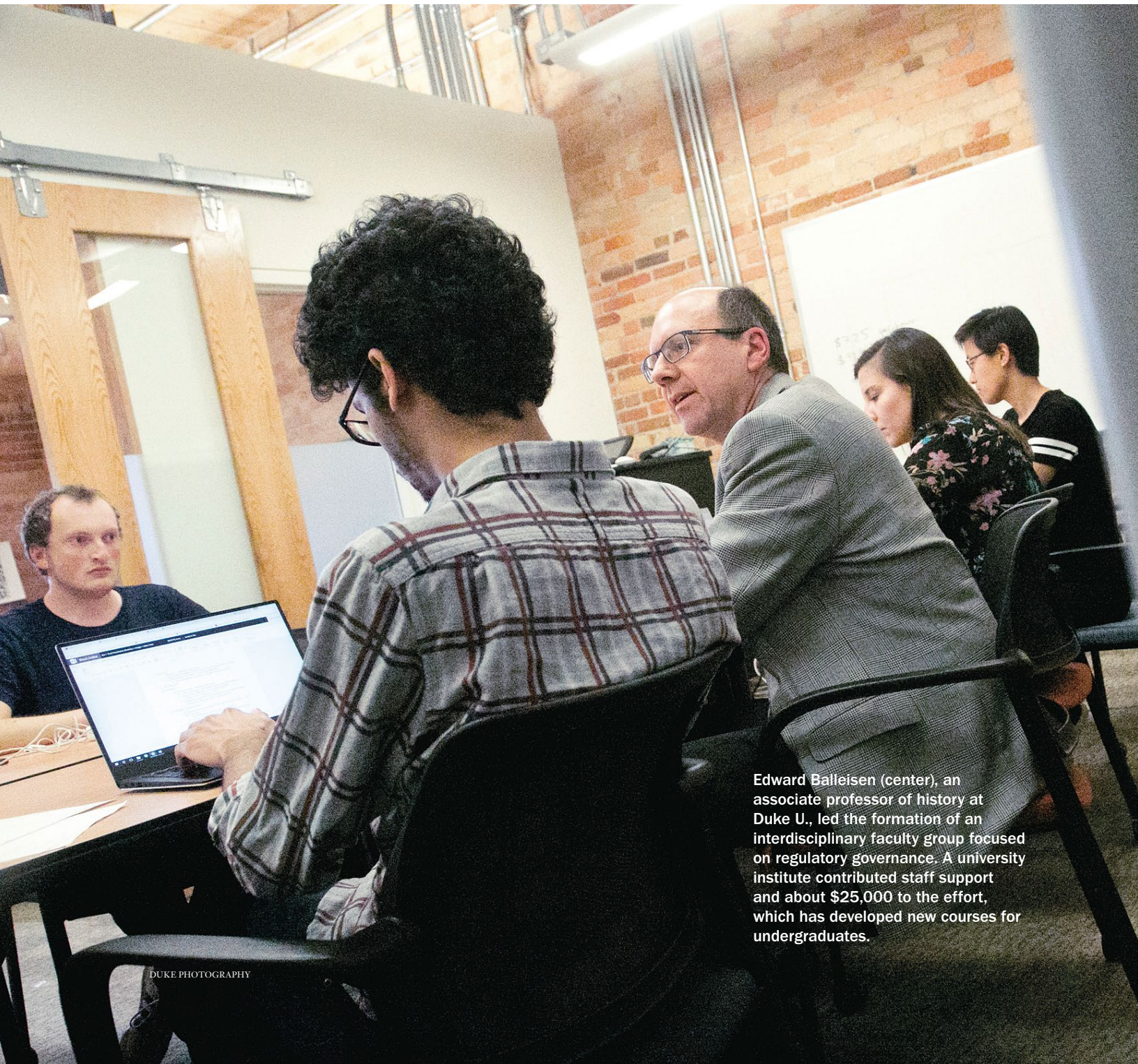
Saving disciplines is the only way to save ourselves.

For questions or comments about the collection, email ci@chronicle.com

Cover illustration by François Berger for The Chronicle

Breaking Down Barriers Across Disciplines

By VIMAL PATEL



Edward Balleisen (center), an associate professor of history at Duke U., led the formation of an interdisciplinary faculty group focused on regulatory governance. A university institute contributed staff support and about \$25,000 to the effort, which has developed new courses for undergraduates.

EDWARD J. BALLEISEN had grand plans for an interdisciplinary collaboration at Duke University back in 2010. The associate professor of history crisscrossed the campus and met individually with 25 faculty members to gauge their interest in being part of a group that would study regulatory governance. He found strong interest. What he really needed, however, was money and logistical support.

For decades, colleges have waxed poetic in strategic plans and speeches about the need to support interdisciplinary research. But many have been slow to devote administrative resources to overcome the considerable financial, bureaucratic, and cultural hurdles that prevent more faculty members from producing such scholarship. Advocates of interdisciplinary research say it is increasingly necessary in an interconnected world where solutions to global challenges are rarely found in a single discipline.

Balleisen was lucky. Over several years, he says, Duke created a culture that encourages faculty members to connect with colleagues in other departments. Part of that effort includes seed money for collaborative projects and the creation of a series of centers on campus that don't belong to any college, but instead serve as hubs to connect disparate faculty members.

Balleisen received roughly \$25,000 from one such center, the Kenan Institute for Ethics, which also provided staff support to arrange meetings while the collaboration of scholars from history, political science, law, and other disciplines was fledgling. Now, almost seven years later, the group has created new courses for undergraduates, including "The Modern Regulatory State," and has secured an external grant to help it recruit even more faculty members. While economics has been the most influential discipline to work on regulatory issues in recent decades, Balleisen says, many other fields contribute to a fuller understanding: Scientists and engineers, for example, are helpful on risk assessment, political scientists on policy, legal scholars on the procedural requirements of regulatory policy, and historians on how regulatory governance evolves.

"This could never have happened without the structure of the institute," Balleisen says. "Just assuming that any idea worth exploring is going to happen on its own is actually unrealistic."

WHILE ACADEME is far from resolving complicated questions surrounding interdisciplinary research, Duke isn't alone in finding ways to grease the wheels of collaboration on campus.

A major barrier to interdisciplinary research is the need to change the culture around tenure-and-promotion standards. Junior faculty members, with good reason to worry, are unsure how they'll be evaluated for work that crosses traditional disciplinary boundaries. A 2004 National Academy

of Sciences survey found that provosts and other academics ranked "promotion criteria" as the primary impediment to interdisciplinary research. And while colleges have since made headway in embracing interdisciplinary research, institutional culture continues to be a barrier, says Julie Klein, an emerita professor of humanities at Wayne State University who studies how such work interacts with tenure and promotion practices.

Creating a culture for interdisciplinary research requires constant communication, especially when it comes to tenure and promotion for junior faculty members, says David K. Rosner, a Columbia University professor whose work connects social history and public health.

When junior faculty members in Rosner's interdisciplinary program were coming up for tenure, he made sure he was on their promotion committees, he says. He wanted committee members from the medical center to benefit from the expertise of a historian.

"You need an appropriate mix of bottom-up enthusiasm and creativity, and a structure to provide support."

There was, in fact, much that professors in the medical center needed to know about history. Rosner often found himself explaining the nuances of his discipline, which measures success in very different ways than do medical fields.

Historians, for example, often do not require large grants to do their work, and may need as little as a computer and some travel money. They are far more likely to be evaluated based on the books they write rather than by peer-reviewed scientific articles and research grants.

"You worry that if they're left to their own devices, the first criteria they'll come up with is what's his or her overhead, or how much NIH money did they get?" Rosner says. "One of the things I'm always explaining is that a Guggenheim is really a signal of intellectual attainment even though it has very little money attached to it. Every generation, in some sense, has to be re-educated."

Merlin Chowkwanyun, an assistant professor in sociomedical sciences, Rosner's program, says he's not as concerned about how his interdisciplinary work will affect tenure and promotion because his department has a tradition of encouraging collaboration. "If I was in a traditional history department, I'd

probably have more concerns,” says Chowkwanyun, who has a doctorate in history and a master’s degree in public health.

Perhaps even more challenging is how to create a culture that signals to scholars — whether senior professors or graduate students — that interdisciplinary research will be valued. To do this, some colleges are rethinking how they communicate what scholarship they prize. The University of Southern California, for example, recently overhauled language in its tenure-and-promotion manual to strip references to “independent” scholarship.

“Becoming an ‘independent investigator’ is the way we’ve measured someone’s career advancement, but that seems to be inconsistent with the goal of interdisciplinarity,” says Randolph Hall, USC’s vice president for research. “Frankly, a lot of people still use that language. What we try to value instead is your impact. And your impact could be part of a team, or as an individual.”

Since Hall started his research post in 2010, he has noticed a change in how faculty members view the university’s commitment to recognizing collaborative research. “When I started, there were numerous, numerous complaints that the university just didn’t recognize interdisciplinarity, that we didn’t care about it,” he says. Now, “if anything, the complaint I might get is that we don’t recognize individual work enough.”

But change requires more than just messaging. Support for interdisciplinary research needs to be embedded in an institution’s culture. Hall says Southern California established an office led by experienced federal grant officers that focuses on helping large interdisciplinary teams craft complicated proposals for federal grants and other outside money.

“What normally will happen on these large proposals is different people will write different sections of the proposal, and assemble it into a larger document,” Hall says. “Where many people fail is they don’t sufficiently edit that public document to make it speak to a common theme. That’s where the grant-writing support helps.”

FOR INTERDISCIPLINARITY to flourish, barriers must be broken down at several levels of the university, and one position central to such efforts is that of the dean. Yannis C. Yortsos, dean of USC’s engineering college, advocates for what he calls “engineering plus” — a mind-set that encourages faculty members to think about how their work could be valuable to other disciplines and help solve societal challenges.

Engineering professors, for example, have teamed up with their counterparts in the cinematic arts to create video games, and with those in the school of social work to develop ways artificial intelligence can be used to prevent the spread of HIV among homeless youth.

While Yortsos frequently communicates the worth of interdisciplinary research, he says faculty members are often enthusiastic about such collaboration and don’t need much persuasion. Administrators need to strike the right balance — allowing the research to develop organically, but stepping in with university resources when an effort looks promising.

“The only thing to do from a dean’s perspective is to make sure you don’t create obstacles for people who want to pursue this research,” he says. “You also need champions on both sides. The intent to collaborate has to be equally strong on both sides. You can’t go to the school of theater and say, ‘Look, I have a solution to your problem.’”

That kind of support requires a top-level commitment to interdisciplinarity. At Duke, Balleisen now holds the title of vice provost for interdisciplinary research, and helps other researchers start their own group projects.

“This type of representation in the provost’s office was really important to figure out how to get around obstacles that impede interdisciplinary research,” he says.

“You need an appropriate mix of bottom-up enthusiasm and creativity, and a structure to provide support.”

Originally published July 21, 2017

Rethinking Funding Structures

By PAUL BASKEN

Eli Berman, a professor of economics at the University of California at San Diego, does work that many would see as vitally important: He analyzes global trouble spots in the hopes of keeping the country out of wars. But he has struggled to get the money he needs to finance his research.

That's a woefully familiar lament these days.

Yet Berman's problem is far more fundamental than just a shrinking federal budget: While his work may have broad implications, it's not clear that any single agency is responsible for supporting it.

That's because Berman, research director for international security studies at the UC Institute on Global Conflict and Cooperation, is filling a need that government structures seem not to have anticipated. He flies to war zones, then to meetings with State Department and Pentagon officials, trying to keep them up to date on world crises and scientific insights that might help in dealing with them.

The job, basically, is to "explain to the federal government what to do with the research that they spent money" on, Berman says. But, he says of his mission, "it's dark and cold and lonely, because it really falls between the cracks."

That appears to be an increasingly common problem, not just in national security, but across the research spectrum. Government structures for financing science may make sense for reasons of professional development, economics, and tradition, but they're not necessarily built for optimal problem-solving.

The National Institutes of Health is the largest provider of basic research money to universities. Like the National Science Foundation and other agencies, it also finances work to convert research findings into real-world uses. At NIH, that translational work includes spending more than \$600 million a year on a division devoted primarily to converting lab discoveries into new pharmaceuticals. It spends another \$200 million apiece on major new initiatives in neuroscience and individually tailored medicine.

Benefits undoubtedly will flow from such efforts, says Sandro Galea, dean of public health at Boston University. But more valuable, Galea says, would be



DAN AGUIRRE

The structures that support university science should be designed from the start to identify and pursue society's biggest problems, says Sandro Galea, dean of public health at Boston U., rather than focus only on discipline-based segments of those problems.

structures designed from the start to identify and pursue society's biggest problems, rather than tackle discipline-based segments of those issues. "When you start asking what matters most, it really changes how you look at things, and it changes what you take on," he says.

COMMON CALCULATIONS

The interest in government structures comes, in part, because private funders may be little better. Alzheimer's disease, as one major and growing

example, is estimated to cost the nation more than \$200 billion a year, making it one of the most expensive chronic diseases. Research so far shows that exercise can help prevent Alzheimer's better than any known medication. Yet out of about a dozen grant programs offered annually by the Alzheimer's Association, the largest nonprofit funder of Alzheimer's research, just one focuses on nonpharmacological strategies.

Meanwhile, some of the most-ambitious research universities have embraced a "grand challenges" format, in which they pick a formidable problem or two and then assemble research teams to tackle them. One of the biggest programs, at the University of California at Los Angeles, aims to make the city fully self-sustainable on energy and water by 2050, and eliminate the burden of depression by 2100.

But even a grand challenge has its limits. While scientific projections suggest that much of the city might be underwater by 2100, climate didn't show up on UCLA's list. That's because UCLA's two choices reflect not just the importance of the challenges, but also the university's ability to grow existing research strengths, says Michelle Popowitz, assistant vice chancellor for research and executive director of UCLA Grand Challenges program. "We could see there's funding in these areas," she explained.

Those types of calculations are common, says Benjamin G. Bishin, a professor of political science at the University of California at Riverside. "We essentially have a system where problems are prioritized based on economic impact for the people who are going to do the studies," Bishin says.

Universities increasingly engage in "cluster hiring," through which they strategically recruit for select departments with an eye toward revenues and future fund raising, Bishin says. "The problem is that the foci of those clusters doesn't come about from a discussion of what are the most pressing social problems. It comes about from how the faculty think we can improve the research profile of the university," he says. Bishin cites the opening in 2013 of Riverside's new medical school — a financial gamble for California's cash-strapped public-university system, he says, but a clear winner for the campus's leadership and its credentials as a research hub.

Far too much university research and funding, Galea says, is dedicated to making increasingly precise tallies for relatively minor issues. Instead of paying researchers to count how many blueberries per day may cut the risk of heart attacks, Galea says, universities and their funders could more systematically identify and tackle the root causes of social problems — such as tolerance of violent attitudes, indifference to environmental concerns, and large and persistent gaps in wealth, education, and economic opportunity.

'PICKING WINNERS AND LOSERS'

Some federal support for science does reflect that ambition. Robert C. Bailey, a professor of epidemiology at the University of Illinois at Chicago, gets money from the U.S. Centers for Disease Control and Prevention to promote male circumcision in Kenya as a way of reducing AIDS infections. His team works directly with Kenyan villagers to discuss their concerns on matters including the pain and cost of the process and how it fits with cultural and religious mores. He also tells them about the benefits he sees, such as improved hygiene, protection from disease, and enhanced sexual performance. Bailey says his team was about halfway to its goal of 23 million circumcisions, which would be expected to spare Kenyans millions of new infections and save them billions of dollars.

The NIH has one division, the Fogarty International Center, that is especially concerned with real-world implementations of research, says its director, Roger I. Glass. Its projects include reducing farm injuries in China, khat addiction in Yemen, and fetal alcohol syndrome in Russia. Putting research into practice is a tough learning process for scholars, Glass acknowledged. "We know a lot about science here, but we don't know how to implement the science that we discover," he says.

Those efforts are rarer for problems within the United States, where NIH's focus on real-world outcomes is largely a matter of assisting drug development. "Their translational push is much more at the lab bench than it is in society at large," Rush D. Holt Jr., chief executive of the American Association for the Advancement of Science, says of NIH.

"We essentially have a system where problems are prioritized based on economic impact for the people who are going to do the studies."

NIH and other government agencies are acting out of fear of Congress, Holt says. "If you're actually trying to take some technology or some social-science finding or some medical-science finding and drive it out there to help people, immediately you'll be accused of picking winners and losers," he says. "They'd rather let the market pick the winners and losers, and of course what that means sometimes is some of these technologies don't get to people who need them, or particularly they don't get to the

neediest of people.”

Perhaps one of the hottest hot-button issues in American society is gun violence. Congress has largely forbidden the NIH and CDC from studying the problem. Those restrictions wouldn't be such a concern, says Garen J. Wintemute, who researches gun violence at the University of California at Davis, if more government-sponsored science was aimed at larger-scale solutions, such as confronting macho attitudes and promoting mental calm and empathy.

“There are more than 300 million firearms in the U.S., and they're not going away,” says Wintemute, a professor of emergency medicine. “We need strategies that work with those firearms present.”

Change may be coming. Despite his frustrations in getting national-security research into the hands of policy makers, Berman says the Pentagon now has one of the government's better models for making effective use of science because it hires enough experts to give it a significant capability to conduct its own research in-house. “Because they do research, they're connoisseurs of research,” he says. “They know good research when they see it.”

And the NSF has just embarked on a project that could give a huge boost to putting research in the real world. In 2011 the agency created a program known as the Innovation Corps, which teaches researchers to think like entrepreneurs and create businesses based on their product ideas. The pro-

gram has since spread to NIH and other federal agencies. And now the NSF has awarded a grant to Angela M. Evans, dean of public affairs at the University of Texas at Austin, to create a new version of I-Corps for researchers working on public policy and nonprofit endeavors.

“Some of these technologies don't get to people who need them, or particularly they don't get to the neediest of people.”

Armed with some of the key I-Corps skills — how to define and find customers, for example — university researchers could make real-world implementation a more standard component of their grant-financed work, Evans says. With time, she says, government support might also help overcome the fact that universities' tenure-and-promotion systems tend to reward scientific outreach that generates patents and licenses rather than broad social benefit.

Originally published January 27, 2016



MATTHEW LESTER, SWARTHMORE COLLEGE

The “see-and-be-seen” place at Swarthmore College is Eldridge Commons, heart of a building that brings together a variety of science departments.

Buildings That Foster Collaboration

By LAWRENCE BIEMILLER

IN 2005, Swarthmore College opened a new science building that for the first time brought biologists, chemists, computer scientists, mathematicians, and physicists together under one roof. The project was partly a result of renovation needs on the campus, but it also reflected what

was then a budding new interest in designing buildings to encourage interaction among faculty members in different disciplines.

At the heart of the Swarthmore complex is Eldridge Commons, a glass-walled, high-ceilinged, see-and-be-seen destination with long tables and a

coffee shop. “It’s one of the most successful spaces on campus,” says Rachel Merz, a professor of marine biology who was one of the faculty members involved in planning the building. Previously, she says, none of the college’s science buildings included social spaces, but now Eldridge “has a whole life of its own, starting in the early morning when there’s a coffee klatch of faculty members chatting and going through the arc of the day.”

“It’s not just scientists,” she says. “A lot of people from the social sciences and even the humanities come and have their coffee there. Even after the snack bar closes, it’s a place for students to hang out.” Eldridge has been so popular as a communal work space that Swarthmore added more tables, and professors of some first-year science courses even hold office hours there, on the theory that students who might be reluctant to seek them out in their offices will feel more comfortable joining classmates at a table.

Since the trend toward interdisciplinary buildings began spreading across campuses 15 years or so ago, architects and university administrators have put up a wide range of buildings designed to give scholars with divergent interests reasons to talk with one another. Many of the first interdisciplinary projects were intended to bring scientists from different fields together to share ideas and expertise in fast-developing areas like neuroscience, but more recently colleges have broadened the interdisciplinary approach to include the humanities and even the arts.

Still, many academic buildings go back to the 19th and 20th centuries, long predating the idea of

using design to encourage interaction. And even institutions that have embraced the idea of interdisciplinary structures are in most cases still dominated by buildings with limited flexibility — to say nothing of faculty members cautious about change of any sort. So think of interdisciplinary buildings as a kind of slow-motion trend that is working its way across even the biggest campuses one construction project at a time.

Some colleges are renovating not only their buildings but also the way their professors interact.

Stanford University’s 2003 Clark Center was among the earliest high-profile interdisciplinary buildings. Conceived as a biosciences facility “in which social encounters and impromptu conversations are regarded as integral to scientific endeavor,” as Stanford describes it, the Clark Center brought medical experts together with scientists, engineers, and humanities professors. Rooms in the complex open onto exterior balconies rather than interior hallways. Lab benches and desks are mounted on wheels so they can be easily reconfigured as teams’ needs evolve. A cafe rounds out the offerings.



Social spaces, like this one in an interdisciplinary science building at Arizona State U., don’t qualify for federal reimbursement of research-overhead costs. So now “we don’t build any single-purpose space,” says the university architect.

ANDY DELISLE, ASU

The Clark Center was such a success that Stanford has continued planning interdisciplinary buildings, including one that will house a Neurosciences Institute and an institute called ChEM-H (Chemistry, Engineering & Medicine for Human Health). And other institutions have followed suit — notably Arizona State University, which has five Interdisciplinary Science and Technology buildings open, a sixth under construction, and a seventh in the planning stages, according to Edmundo Soltero, the university architect.

Despite the popularity of interdisciplinary projects, Soltero says Arizona State's experience hasn't exactly paralleled Swarthmore's, at least as far as social spaces go. "These atriums and lounge spaces end up being empty," he says. "Coffee and snacks is not going to do it." And because the zones meant for socializing are not dedicated to particular research projects, the federal government doesn't allow those spaces to be included when the university calculates research-overhead costs that can be supported by federal grants. So now, he says, "we don't build any single-purpose space," although multipurpose spaces that are suitable for other uses, as well as for socializing, are permitted.

As for the earlier interdisciplinary buildings and their atriums and lounges, he says, some members of his staff look carefully at how spaces are used and do their best to reprogram those that are underutilized. "We have a lot of churn," he says. "There's always researchers coming in with a three-year grant, a two-year grant" who might be happy in an underused space after a little reconfiguring.

Grinnell College has had an interdisciplinary science center for several years now that "has worked very well in fostering some strong interdisciplinary programs," such as in neuroscience and biological chemistry, says Michael Latham, vice president for academic affairs and dean of the college. So Grinnell is planning a similar facility for its humanities and social-sciences departments. The complex will incorporate two existing buildings as well as 147,000 square feet of new construction, and will house 145 faculty offices and 39 classrooms.

"Grinnell is becoming more and more committed to interdisciplinary learning," Latham says. This is because "the really interesting problems" — climate change, food security, public health — "require that you integrate knowledge from across different fields." The new building will be organized into five academic "neighborhoods" that will mix different departments. One, for instance, includes gender, women's, and sexuality studies; history; English; and classics; another pairs political science and economics.

"Offices will be interspersed," he says. "The people on either side of you will probably not be in your department. The purpose is to create intellectual collisions." The building will also have a wing with offices reserved for interdisciplinary collaborations. "You

could work on a project there for two or three years and then rotate back into the academic neighborhoods."

In the works at Spelman College is a 100,000-square-foot interdisciplinary building. The president, Mary Schmidt Campbell, saw an opportunity not only to replace an obsolete fine-arts building but also to wrap a growing computer-science program into the project. The interdisciplinary innovation center is modeled, in part, on the Interactive Telecommunications Program, or ITP, in New York University's Tisch School of the Arts, where



EVAN KRAPE, U. OF DELAWARE

Lab work and lectures proceed simultaneously in the U. of Delaware's 194,000-square-foot Harker Interdisciplinary Science and Engineering Laboratory, completed in 2013.

Campbell was formerly dean.

"We're really focused on making it the place where innovation, experimentation, and risk-taking can take place," says Campbell. "The innovation lab will be the hub, and arrayed around it will be arts and computer science. The entire building will be designed to invite other disciplines to come in and participate.

"We've gone out of our way to make it clear that this is a new building for all of Spelman's faculty and students."

That said, Campbell notes that Spelman already has one tremendously successful interdisciplinary tradition: Fried Chicken Wednesdays in the dining hall. "It's so crowded you have to sit wherever you can sit. It gets people out of their offices and forces them to meet people." And no special building is required.

Originally published July 17, 2017



Paul D'Anieri, provost at the U. of California at Riverside, has pushed the idea of cluster hiring.

PHOTOGRAPHS BY TODD BIGELOW FOR THE CHRONICLE

The Promise and Peril of Cluster Hiring

By BETH MCMURTRIE

IN 2014, the University of California at Riverside announced a hiring initiative to add 300 faculty members to its ranks. As part of that ambitious effort, it planned to hire groups of people to work on interdisciplinary research, raise the university's profile, and improve the diversity of the faculty.

Riverside's professors were excited. The university had long toiled in the shadows of more-prestigious UC campuses and had suffered budget cuts in recent years. This hiring spree, with an emphasis on innovative work in clusters of disciplines, would help rejuvenate the campus.

But just a few months later, the process began to unravel. After 26 cluster proposals were chosen last spring from dozens submitted, professors complained that the selection process was opaque. They didn't think the clusters aligned well with existing departmental hiring plans. And they worried that added layers of review would result in failed searches.

Last month, following the release of a faculty survey that detailed these and other problems with the cluster initiative, Chancellor Kim A. Wilcox hit the pause button. Beyond the 76 approved positions for hire this year, he put new cluster hires on hold until the process could be improved.

Riverside's experience illustrates both the promise and the peril of cluster hiring, which has been growing in popularity across academe. Indiana University and the Universities of Illinois, Notre Dame, and Central Florida are just some of the places that have engaged in cluster hiring in recent years.

On the one hand, its appeal is clear. Recruiting groups of people from diverse disciplines to tackle global problems such as climate change or perform cutting-edge research in areas like neuroscience can gain publicity, produce important work, increase collaboration across campus, and attract new sources of money.

On the other hand, because it operates outside the traditional boundaries of hiring — departments deciding their direction — cluster hiring can add layers of red tape and confusion. Some faculty resist cluster hires because the process cedes control typically held by departments to senior administrators. Clusters can be hard to manage because new methods for evaluating service, research, and publication records must be devised. And clusters can be complicated to sustain. Researchers and administrators move on; priorities change.

Administrators at colleges that have tried cluster hiring say it helps to start slowly and from the ground up. Without faculty buy-in, as well as time to review effectiveness, cluster hiring won't work, or at least won't work as well as it could. It also helps, they say, to build on existing disciplinary strengths and established interdisciplinary work, rather than starting something from scratch. Without those elements, plans can quickly go awry.

Riverside's cluster-hiring effort is the brainchild of its vice chancellor and provost, Paul J. D'Anieri, who arrived in July 2014, just a few months after Wilcox announced that the university would be hiring 300 new faculty members. It was D'Anieri's idea to set aside a portion of those hires to build interdisciplinary teams, acknowledging the university's strategic plan to raise Riverside's profile, particularly in research. He also wants to increase faculty diversity on a campus where about 30 percent of students identify as Chicano or Latino.

To finance the new hires, Riverside is relying on a combination of rising enrollment and tuition increases, along with unallocated recurring revenue thanks to conservative budgeting during the recession, D'Anieri said.

Professors were intrigued by the cluster idea, which encourages them to think innovatively and across disciplines. "I was thrilled about it," says Timothy Lyons, a professor of biogeochemistry. "It immediately made sense to me."

Lyons was one of many faculty members who responded to the provost's request for proposals, suggesting a cluster on planetary science and astrobiology that would build on his work with NASA and with faculty members in the fields of astronomy,



TODD BIGELOW FOR THE CHRONICLE

Professor Timothy Lyons says he was "thrilled" by the cluster idea at first but had concerns about how the plan was rolled out.

physics, and earth sciences.

The first sign of trouble, he and others say, was a lack of detail from the administration. Faculty members found the proposal guidelines vague and the evaluation process unclear. Deans ranked proposals coming from their faculty members, while a separate, anonymous committee, made up of faculty members from across the campus, did its own rankings. D'Anieri reviewed those evaluations and consulted with other senior administrators to come up with the final selections, which he announced last spring.

That list didn't make sense to everyone. Lyons's proposal, for example, was not selected, he says, despite receiving strong evaluations. Yet other, weaker, proposals had made it to the top, he says. He was not alone in his assessment.

Lyons challenged the provost in a town-hall meeting last May. He said the provost was not getting "a full sense for the level of dissatisfaction" among faculty members concerning perceived biases by the administration, which were thought to have led to a number of the best proposals being overlooked, including some "rising stars of excellence" on campus.

D'Anieri tried to be reassuring by saying that if

executed well, the clusters could make Riverside a “star nationally.” But, he added, “there were, to put it bluntly, winners and losers in this process. And I have no doubt that people whose proposals weren’t supported will be upset, and I would say even should be upset. But given the resources that were at our disposal, we made the best choices we could. And I’ll stand by them.”

How upset the faculty members were became clear a few months later. Jose Wudka, a physics professor and chair of the Academic Senate, said that as search committees formed, he began hearing more complaints. Where was the campus going to house all these new faculty members? What kind of infrastructure would be in place to ensure that the cluster hires could work together?

Search committees struggled to coordinate their work with individual departments. Departments complained that all new hires were going toward clusters while their own plans were put on hold.

In December the senate surveyed the faculty to get a clearer sense of the dissent. More than 300 people, or about half of the faculty, responded. Nearly 40 percent said the time provided to prepare a cluster-hiring proposal, about two months, wasn’t adequate. About three-quarters said the selection criteria for proposals weren’t clear and the evaluation process wasn’t transparent. Sixty-nine percent said it was not an appropriate replacement for departmental hiring.

The comments were blunt: “A good number of the faculty feel more disaffected and marginalized by the process.” “Administration seems to be making this up as they go along which does not inspire confidence.” A member of the faculty-evaluation committee called the results “haphazard.” Another called it a “power grab by the provost.”

“Please,” wrote one person, “for God’s sake, take this slowly.”

The faculty senate sent a series of recommendations to the administration last month. Among them: more consultation with the faculty, a “more measured launch” of new initiatives, a transparent proposal review and selection process for future cluster hires, and more support for faculty members hired into clusters once they’re on campus, including sufficient space and staffing.

D’Anieri has taken the criticism in stride, saying that while some problems could have been avoided if the university had rolled out the cluster-hiring process more slowly, “we have a pretty urgent need to move forward.”

Enrollments, he says, are expanding, the campus is growing, and the faculty needs to expand along with it.

He rejects the notion that the process lacked transparency or was a power grab. “Every faculty member on campus was eligible to put in proposals,” he says, noting that some junior faculty members got their proposals approved, something that would not

THE APPROACH

As part of a plan to hire 300 additional faculty members, the University of California at Riverside decided to embark on a series of cluster hires to raise its national profile, diversify the faculty, and tackle important areas of research.

Faculty members were asked to submit proposals that were to be evaluated by their deans as well as by a campuswide faculty committee. The provost, in consultation with others, made the final selection for the first round of hires. That included 26 approved clusters. The areas of research were grouped into seven broad categories: food science, next-generation technologies, human health, environmental science, education and social policy, creative and performing arts, and innovation in business and the social sciences.

WHAT WENT WRONG

Many faculty members were upset by the process and the results. According to a survey, they found the proposal criteria vague and confusing, they didn’t have much time to put together proposals, they thought the evaluation process was opaque, and the final choices didn’t make sense to some. They feared that the cluster-hiring strategy had supplanted departmental hiring strategies. Search committees were unclear on how to move forward. The plan as a whole, some said, lacked strategic cohesion.

THE WAY FORWARD

The faculty senate has asked the administration for more consultation, limited trials, more transparency, better management, and better follow-through for new initiatives. The administration has agreed to slow down the process, and some communication issues have been resolved. But faculty members remain concerned about how cluster hiring will mesh with existing departmental hiring plans.

— Beth McMurtrie



JEFF MILLER, UW-MADISON

Audrey Gasch, an associate professor at the U. of Wisconsin at Madison, is part of a genomics cluster there. The university has hired about 140 scholars in almost 50 clusters since 1998.

have happened under the traditional hiring system.

Robert A. Hanneman, a longtime faculty member in the sociology department, agrees that some of the dissension may be coming from more-senior faculty members. “Here the process was taken out of the departments, and it allows younger and other faculty marginalized by the power structure to have greater input.” At the same time, he says, he is skeptical of the need to use cluster hiring, which he finds faddish, to generate more creative work. “There are good, traditional mechanisms for doing it,” he says. “What would probably be a lower-risk, lower-cost strategy, like creating interdisciplinary programs” on a smaller scale.

Wudka says faculty members are somewhat reassured by the administration’s decision to put a pause on cluster hires but remain concerned about where this leaves departmental hiring plans.

“Cluster hiring tried to force departments to think outside the box, and in that sense it was very successful,” he says. “But it not only forced departments to think outside the box, it pushed them outside the box and said, OK, stay here.”

RIVERSIDE’s plan is more ambitious than most, but cluster hiring is never easy. Proponents, however, say it’s worth the headaches if done carefully.

Florida State University was an early adopter of cluster hiring, unveiling its first proposal in 2006. W. Ross Ellington, associate vice president for research, said the university was looking to raise its profile through faculty hiring, but in a way that could get the most value for the money. The plan was to hire as many as 200 people over five years.

But then the recession hit, the provost retired, and the president moved on. In the end, FSU was able to create just two clusters from that first plan.

Despite the roadblocks, the university has found success as clusters continue to develop under a new administration, says Ellington, in areas such as energy and materials, coastal and marine research, and brain health and disease.

Robert Mark Isaac, chair of the economics department, helped start one of the first clusters, in experimental social science, in which economists and political scientists apply methods such as game theory to designing tax policy and a variety of other social-science challenges.

Isaac says the cluster has been popular, attracting other Florida State faculty members who are not officially part of the nine-person group but are interested in the work. “It did really make FSU stand out,” he says.

Still, he says, change is constant. “The idea that you are going to hire a certain set of people that will create wonderful stability and niceness is upside down,” he says. “The more successful the cluster, the more it’s necessary to have a long-term strategy for people coming and going.”

The University of Notre Dame laid the groundwork for clusters with a series of joint hires in the mid-2000s, says Robert J. Bernhard, vice president for research. Three years ago, it began a cluster program to hire 80 faculty members in 10 areas of research. Proposals came from faculty members, and a cross-disciplinary committee chose the winners, yet Notre Dame still experienced pushback from professors who didn’t see how clusters fit their departments’ strategic plan.

At the same time, says Bernhard, young faculty members seem to find the idea of working in groups particularly appealing. “Many in my generation were raised to be independent contributors,” he says. “Our younger faculty are looking for, Where is the best group for me to join?”

Skeptics counter that proponents of cluster hiring often overlook the opportunity costs. If all your energy is going into a small set of splashy hires, what are you not working on instead?

Jerry A. Jacobs, a sociology professor at the University of Pennsylvania, wrote a book, *In Defense of Disciplines*, partly to counter the idea that higher education needs strategies such as cluster hiring to do interdisciplinary work. He notes that the top 25 research universities run, on average, 100 research centers each, most of which are interdisciplinary. “People have this idea that professors are sitting there isolated in their silos, cogitating on problems and not talking to anyone. But somebody is in these research centers.”

Jacobs also worries that administrators forget that strong interdisciplinary research is built on strong disciplines. In other words, don’t neglect your departments. Abbas Benmamoun agrees. Vice provost for faculty affairs and academic policies at the University of Illinois at Urbana-Champaign, he says its plan to build clusters in areas such as sustainability and health and wellness will be designed around existing strengths. “Strong departments want to collaborate with strong departments, and strong faculty want to collaborate with strong faculty,” he says. “I cannot emphasize this enough.”

One of the biggest questions surrounding cluster hiring is: Does it work? Over all, experts say, little research has been done on whether cluster hiring brings in more research money and raises an institution’s profile. How well it tackles the world’s most pressing problems or produces innovative research has also been difficult to measure.

One report said faculty diversity, often a stated goal of cluster hiring, improved among most of the 10 institutions surveyed. A study by Erin Leahey, a sociology professor at the University of Arizona, found that scholars who engage in interdisciplinary research publish less often but are more highly cited than average.

Perhaps the most scrutinized cluster-hiring program has been that at the University of Wisconsin at Madison. Starting in 1998, the university has hired about 140 faculty members to fill nearly 50 clusters. Michael Bernard-Donals, vice provost for faculty and staff programs, says that early challenges, such as determining service loads or the best way to evaluate publication records, have largely been worked out. It helped, he says, that the campus rolled the program out over a five-year period, enabling leaders to iron out kinks along the way.

Researchers in these clusters have brought in about the same amount of money as their peers have, he says. The real impact has been to foster new academic programs, raise the caliber of the faculty, and enable people across campus to engage in interdisciplinary work. Early innovators — clusters in nanotechnology or genomics, for example — helped spark

new research in fields like engineering, agriculture, and life sciences. Today about 500 of Wisconsin’s 2,000 faculty members are involved in interdisciplinary work, he says, even though only a fraction of them are part of a cluster.

But it’s not as if administrators’ work is over. “What we’re facing right now is what to do with the clusters where excitement has subsided some, or there’s less cross-disciplinary exchange, or the faculty have reverted to disciplinary research,” Bernard-Donals says. Still, he adds, “if there are clusters that haven’t functioned as well as we’d like, we’re still getting a tremendous bang for the buck.”

Back at Riverside, both D’Anieri and faculty members are hopeful that tensions will subside as the problems are worked out and new hires begin arriving on campus. “At some point you lick your wounds. You just take a deep breath and say, we as a department and maybe even as a college are going to benefit from this,” says Lyons, the biogeochemistry professor.

A slew of search committees are working to fill positions in areas such as genomics, next-generation technologies, neuroimaging, indigenous studies, and business analytics research. Among the first hires: Xiaoping Hu, a professor of biomedical engineering from the Georgia Institute of Technology and Emory University, who will run a new neuroimaging center. “To some extent the results will speak for themselves,” says D’Anieri. “If we’re able to hire great people, people will look back and think of this as being a great thing.”

Originally published on March 13, 2016

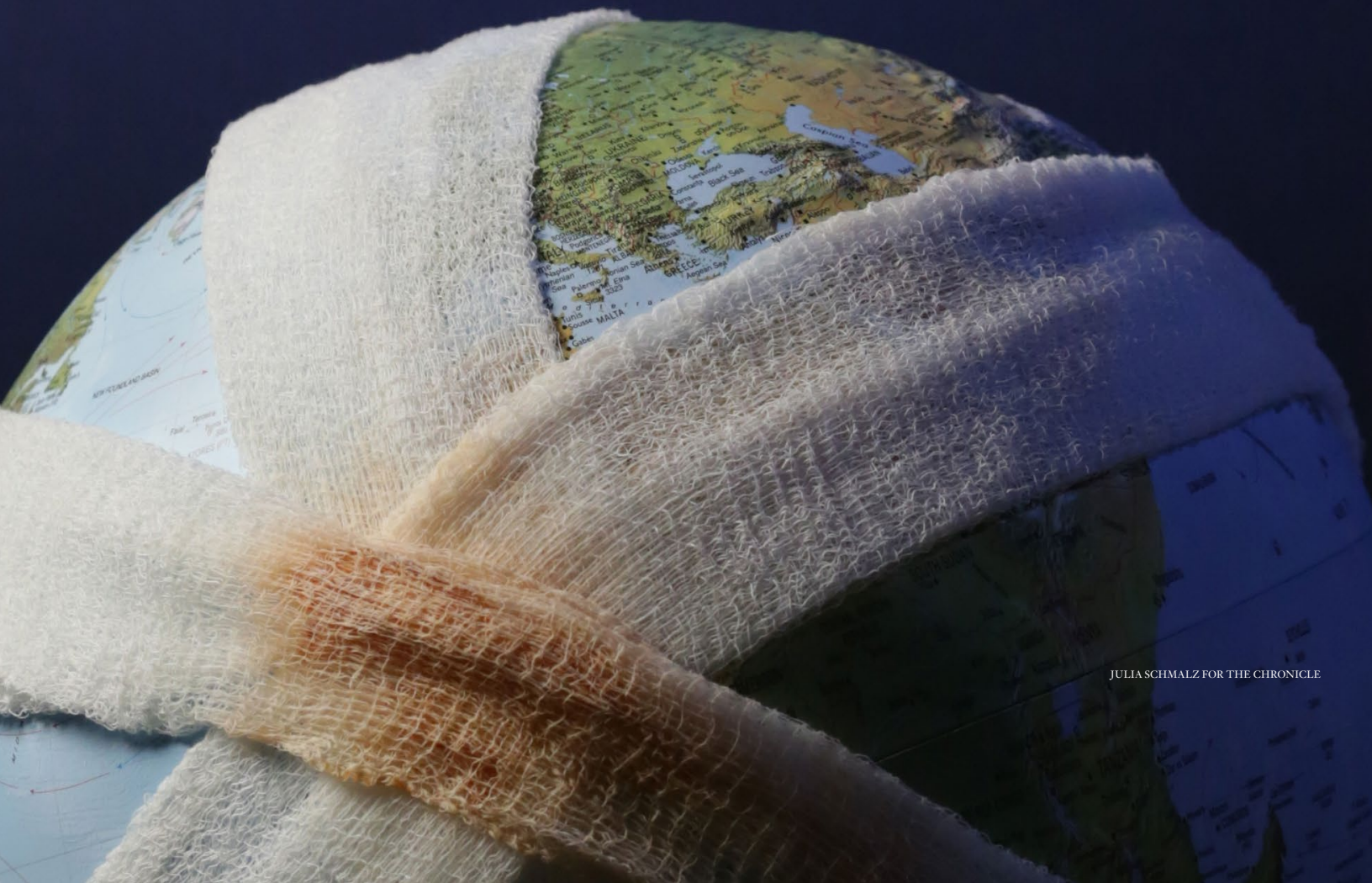


TODD BIGELOW FOR THE CHRONICLE

Can a University Save the World?

By NICHOLAS LEMANN

MAX WEBER's celebrated century-old essay "Science as a Vocation," delivered at a relatively early stage in the history of the modern research university, has the feeling of a manifesto for a priestly class. It proposes a scientist's (read: academic's) professional life that is firmly removed from the affairs of the world. Weber wrote of his ideal scientist that "if he feels called upon to intervene in the struggles of world views and party opinions, he may do so outside, in the market place, in the press, in meetings, in associations, wherever he wishes" — not in professorial life.



And he insisted not only on the separation of academics from nonacademics, but also on the separation of each academic discipline from the others. “Only by strict specialization can the scientific worker become fully conscious,” he wrote, “for once and perhaps never again in his lifetime, that he has achieved something that will endure. A really definitive and good accomplishment is today always a specialized accomplishment.”

One can imagine how exciting it must have been, especially in the United States, where research universities were newer than in Germany, to see these stern but inspiring sentiments given institutional form through the creation of the formal academic disciplines. The lives of scholars were becoming nationalized, even internationalized; tenure, journals, conferences, and academic presses all transcended the bounds of the university where one worked and provided the freedom to engage in a community of widely dispersed colleagues. The growth of peer-reviewed government and foundation funding for research, especially in the sciences, after the Second World War solidified the power of the academic disciplines. Most work is organized vertically, around employers; scholarly research is organized horizontally, around topics.

But now, for many American universities, the role that Weber proposed feels constraining. A new movement is underway: a large number of research universities, 40 or more, have recently launched initiatives that aim to violate Weber’s injunctions against engagement with the nonacademic world and working across specialties. Their purpose is to direct scholarly knowledge outside the university in the hope of making a difference in the here and now. The rubric most often used by these new initiatives is “Grand Challenges.” For the past two years I have been directing one of them, at Columbia, called Columbia World Projects.

The impulse to try to address problems in the real world has swept through American higher education in periodic waves. Our leading public universities now follow the research-university model, but they weren’t founded that way, and they have a long history of doing practical-minded scholarly work meant to be used by state government agencies and local businesses. Crisis reawakens the impulse, so there was another wave after the Second World War, aimed at causes like peacemaking in the nuclear age and Depression-proofing the economy by applying Keynesian precepts. Technical universities have always worked closely with engineering-oriented businesses. Individual faculty members often pursue second careers as policy entrepreneurs, inventors, consultants, and business founders.

The current wave is different. Most of these new initiatives were set up by their university’s central administration and have a presidential stamp of approval. Most of them involve not just interdisciplinary work by academics, but also intensive direct

participation by practitioners from outside the university. Most aim to solve problems, sometimes by proposing policy changes, sometimes by actively bringing research out into the field. Many are interested in the relationship between knowledge and action as a field of study. Together they add up to a loosely organized but concerted attempt to add a new capability to research universities — what Columbia’s president, Lee Bollinger, calls a “fourth purpose,” after teaching, research, and service.

Why is this happening now? One reason is a collective awareness that the match between our institutions and our problems isn’t very good. Geographically bounded governments are not well set up to handle transnational challenges like terrorism or pandemics. Another reason is that major research universities represent extraordinary collections of usable expertise, across every conceivable field, assembled under one roof. Even the largest foundations, NGOs, and think tanks would have to reach outside their own organizations to enlist biochemists, or anthropologists, or mechanical engineers in their work. Universities do not.

There is also a sense that these are urgent times — that the mismatch between politics and disciplined truth-seeking has become severe. Max Weber himself became intensely involved in German politics during and after the First World War, while continuing to insist that science place itself on the other side of a strict boundary. Today that separation seems exaggerated and disadvantageous, certainly for politics and possibly for academics too.

There isn’t space here to go into the particulars of these new entities — which include, just to name a few, MIT Solve, Carnegie Mellon Moonshots, Social X-Change at Stanford, Perry World House at Penn, the Agora Institute at Johns Hopkins, and Grand Challenges initiatives at, among other universities, Georgia Tech, Minnesota, Texas A&M, Indiana, and UCLA. But it is possible to offer a rough typology among them, and to enumerate some of the questions they will have to answer if they’re to grow and prosper.

Everybody in the field is interdisciplinary to some extent, and everybody creates connections outside universities. Some stay within a particular topic area (energy, the environment, inequality), while others operate across the full range of university expertise, focusing on making connections rather than on one domain. Some hold internal competitions for funds they disperse to faculty, and others are more directive, creating new teams and managing their activities.

At Columbia World Projects, for instance, we are launching projects that aim to persuade Ghanaian villagers to switch from high-polluting home cookstoves to clean ones; to use satellite data to predict electric usage in an off-the-grid rural area in Uganda well enough to persuade somebody to invest in creating reliable service there; and to use highly accu-

rate, geographically specific weather predictions to generate steadier crop production in six sites around the world. These are in the developing world, but we are also preparing projects that will operate only domestically, and in areas ranging from election security to decarbonization to water treatment. What the projects have in common is that they address areas where there is a major social need that isn't being met by the conventional economic or political systems. We design all of them with Columbia colleagues in several disciplines, and with partners outside the university.

We design these projects to ensure that they do something new and useful, and that they can make a difference broadly if others take up our work. We also conduct intellectual inquiries in three areas: democratic institutions, rapidly growing cities, and the implementation of scholarly knowledge, in all cases engaging faculty members across disciplines with practitioners from outside the academy.

Although we have had a great deal of enthusiastic participation from our colleagues, there is a distinct sense of structural tension between the established pathways of university research and what we are trying to do.

I'll enumerate a few of the challenges. For faculty members, work on these new initiatives usually doesn't count as a credential that would lead to advancement in their field. This is especially acute for junior faculty nearing a tenure decision. And most Grand Challenge-style efforts, in order to function as intended, require the participation of people who don't have traditional academic backgrounds — whose expertise is action, not research. If success requires that these people be employed, at least for a time, at universities, it's difficult to find berths for them because by the traditional criteria they are usually not eligible for faculty jobs.

Then there's money. Although most of these new initiatives aim to involve students at all levels, none of them so far grants degrees or has tuition as a source of income. Most appear to have initial financial support from the central administration of the university, but that isn't an infinite resource. The government grants that are the primary form of support for university research usually go to a principal investigator, selected mainly on the basis of reputation among peers within a discipline — not to cross-disciplinary efforts whose primary product isn't pure research. Individual, foundation, and corporate funders often want to see evidence that their funds are making a significant measurable difference out in the world, which isn't the metric most faculty are trained to aim for.

In the work itself, the main question is how to bridge the daunting gap between solving a significant problem in a notional way and actually implementing at least a part of the solution. To do that requires humility, flexibility, discipline, and a keen sense of timing. Some solutions sound great

in a seminar room but not so great to the people they're meant to help. Partner organizations — NGOs, government agencies, businesses, community groups — will have their own experiences and constraints, which can't be ignored. Universities don't have the political power, resources, or staying power to heal the world by themselves. They have to figure out exactly what their most useful contribution is and how to get other elements of society to work with them to do the rest. And the temptation to declare every effort a success based on insufficient anecdotal evidence has to be resisted.

One reason universities have proved to be so durable is that they've been adventurous about experimenting with new capabilities. The establishment of the disciplines, and later of the research-funding apparatus that helps support them, doesn't represent the final stage in univer-

There is a sense that these are urgent times — that the mismatch between politics and disciplined truth-seeking has become severe.

sities' development. Professional schools, for example, predate the modern research university, but they changed and grew substantially in the research-university era, even though they are by definition more connected to the external society than the traditional definition of academic research would permit.

It's perilous to assume that if something has value, it should become part of the university landscape; nothing can thrive without a deep understanding of and connection to its host environment. But if a new part of academic life builds on universities' strengths, and if universities are willing to adapt in order to add a significant new capability, the results can be miraculous. As a category, the new initiatives devoted to turning university-based knowledge into action are somewhere between infancy and toddlerhood, but their potential to add to what research universities do is large. They need, and deserve, to be nurtured.

Nicholas Lemann is a professor of journalism and dean emeritus at Columbia University's Graduate School of Journalism, and director of Columbia World Projects. He is also a staff writer for The New Yorker.

Originally published on November 21, 2019



The Interdisciplinary Delusion

By JONATHAN KRAMNICK

FIVE YEARS AGO when Ohio State University announced a \$400-million plan to hire 500 professors over 10 years, officials specified that the new faculty would be attached to supradepartmental “discovery themes”: health and wellness, food production and safety, energy and the environment, data analytics and materials for a sustainable world, and so on. Hiring around these themes would allow the university to “develop transformational approaches to issues of world-wide significance” and bring together “interdisciplinary teams of experts ... to cooperate in developing solutions to the long-term issues that touch human beings everywhere,” as the news release put it.

Interdisciplinary fantasies of this variety are very much of the moment. Sometimes the vision looks forward with futuristic optimism. Just as often it seems like an excuse for cost-cutting austerity. Last year, the chancellor of Southern Illinois University proposed to “eliminate the primary obstacles for multidisciplinary interaction — the financial structure associated with departments.” In August the University of Akron announced that it would eliminate 80 degree programs to “increase resources in degree programs of greatest interest, opportunity and benefit to students” and “foster greater interdisciplinary collaborations.” Goucher College followed suit by revealing that it, too, was eliminating several majors while envisaging “new interdisciplinary combinations” that might be “more appealing to students.”

The desire to overcome boundaries between disciplines is not in itself new. Specialization has always had its discontents, and programs for interdisciplinary cooperation or the creation of new disciplines out of the synthesis of old ones are perennial features of academic life. What seems distinctive about the current moment is the argument against the very existence of disciplines and departments in the first place. At its most extreme, this new vision endeavors nothing less than a complete redrawing of the basic units of the university, so that once-separate departments of, say, economics, chemistry, or music dissolve into an open flow of information among scholars with varying skill-sets.

Whether it comes from well-funded initiatives to create new centers of inquiry or barely concealed attempts to cut expenditures, there is increasing pressure to find common cause with different kinds of colleagues, especially if these colleagues happen to come from the natural sciences. One should “think big.” The result is a certain shame at merely pursuing the questions of one’s home discipline, at being, for example, a historian who can’t join forces with a computer scientist, or an anthropologist who can’t find an ecologist and tap into money earmarked to study climate change.

In principle, demands to look beyond one’s home field should apply to the full range of study

from astronomy to zoology. And yet they never do. There is a reason humanists in particular feel that calls for them to be interdisciplinary are attacks on what they do. Arguments that undercut the foundation for separate disciplines apply disproportionately to those with depleted capital. Humanities departments are far more often called to justify their existence, and far more often encouraged to coordinate their work with what’s going on elsewhere, than, say, departments of electrical engineering. That this is so is hardly surprising but is worth some thought.

One direction our thought might take us is to the nature of disciplines themselves. A discipline is an academic unit. It is neither a naturally occurring category nor an arbitrary relic of the history of higher learning. Rather, a discipline is an evolving body of skills, methods, and norms designed to explain parts of the world worth knowing something about. To recognize the importance of disciplines — to fight for their survival — is therefore to advocate for a picture of the world, an ontology. It is to insist that the world does not have a single order that is adequately captured by, for example, biology or physics or computation.

To recognize the importance of disciplines — to fight for their survival — is therefore to advocate for a picture of the world, an ontology.

A pluralistic array of disciplines matches up with a pluralistic vision of the world: endocrine cells for the biologists, tectonic plates for the geologists, librettos for the musicologists, and so on. Pluralism of this variety should put limits on the way disciplines are coordinated. It should insist that no one discipline is reducible to another. It should also provide the foundations for an interdisciplinarity that is interactive, not reductive, one that takes as its premise that each discipline has something to contribute to matters of shared concern in virtue of its own methods and objects. This is an interdisciplinarity worth having.

In an essay that went viral several years ago, Steven Pinker lamented that the humanities have “failed to define a progressive agenda” and are resistant to “innovation” because they have rejected any influence from the sciences. “Art, culture, and society are products of human brains,” after all, so what’s stopping humanists from putting them all

together? This plea for reform is consistent with a more general sense that “art” and “culture” need to be coordinated with the study of such things as “human brains,” but Pinker’s critique distinguishes itself by squarely addressing relations of power within higher education.

Consider this ominous anecdote: “Several university presidents and provosts have lamented to me that when a scientist comes into their office, it’s to announce some exciting new research opportunity and demand the resources to pursue it. When a humanities scholar drops by, it’s to plead for respect for the way things have always been done.” This juxtaposition of the excitingly new with more of the same is glib and moralizing, but the language Pinker uses is interesting all the same. Why does he assume that value ought to fall on excitement and novelty, that an institution whose distinctive rationale has been the continuity of research ought to prefer what he calls “innovation”?

A cliché sprung from the tech industry and business schools in the mid-’90s to describe how companies can appeal to neglected sectors of the market, “innovation” is now so ubiquitous in academic culture as almost to pass without notice. Pinker pairs it however with a sibling piece of corporate jargon — “silo” — that is worth our attention. “If anything is naïve and simplistic,” he writes, “it is the conviction that the legacy silos of academia should be fortified and that we should be forever content with current ways of making sense of the world.” Surely many readers of this essay have at some point heard a dean or outside consulting agency decry faculty lodged in silos, or departments siloed in tepid irrelevance, each split off from the other. The history of this pejorative and its migration into the lexicon of university administration tells a fascinating story.

Like “innovation,” “silo” emerged in business schools in the same era as part of an effort to describe strategies for responding to customer needs and technological change. According to the influential “customer-focused solutions” model of management theory developed at the time, a silo is any “system, process, department etc. that operates in isolation from others” and thus prevents the efficient flow of information from one unit of an organization to another. A corporation whose finance or research or sales divisions are walled off from each other has too many silos, the argument goes, and so finds it difficult to be flexible with respect to markets and innovative with respect to products. A successful corporation therefore should strive to *break down* its silos and “connect the dots” between previously isolated bits of data or expert practices. Employees should be routinely shuffled, and even well-functioning products remade.

It is something of a wonder that an account of how to optimize the internal structure of a cor-

poration, an organization designed to maximize profits, has been brought to bear on the university, an organization designed to explain the world. To get a sense of how far this migration has gone we might compare a 2007 article from the *Harvard Business Review* titled “Silo Busting: How to Execute on the Promise of Customer Focus” to a recent, much-lauded multi-author study, *The Undergraduate Experience: Focusing Institutions on What Matters Most* (2016). Here is the article in *HBR*:

To deliver customer-focused solutions, companies need mechanisms that allow customer-related information sharing, division of labor, and decision making to occur easily across company boundaries. Sometimes this involves completely obliterating established silos and replacing them with silos organized around the customer, but more often it entails using structures and processes to transcend existing boundaries.

Here is *The Undergraduate Experience*:

Strong institutions align their resources, policies, and practices with their educational purposes and student characteristics, just as well designed courses align goals and assessments. While this may sound self-evident, it can be vexing because higher education institutions often operate as collections of strong but separate programs. Thriving institutions transform silos into systems by supporting cross-unit coordination and by paying more attention to the student experience than to how the organizational chart divides up the campus.

Critics of the corporate university often speak of the pernicious influence of actual companies and bottom-line thinking on the governance and ethos of higher education. The idiomatic drift one sees in these two goblets certainly partakes of the larger phenomenon, but it does so particularly around the question of organizational structure. The silo busting designed to match “strategic packages of products and services” to consumers comes instead to match “resources, policies, and practices” to the “student experience.” Facilitating this move are several other related keywords in the management-theory lexicon: “Coordination” is one of the “The Four Cs of Customer-Focused Solutions,” for example, and “systems thinking” is *the* term of art for understanding the entire corporation as “a learning organization.” The busting up of academic disciplines thus involves a transposition at once of a dialect and a plan — a dialect that is a plan — to remake the fine composition of the university itself.

A university would still divide into parts, but these would be flexible, open-ended gatherings defined in relation to an evolving market: students and the problem-solving, challenge-posing world in which they live. The ideal is of a *cluster* that might take shape around a given problem or challenge while sharing temporary space on a hiring plan. Whereas silos (i.e., disciplines) stake their claim on inherited expertise, clusters draw from topics external to the disciplines that fall under them and eventually disappear.

To get us to this bright future, existing forms of expertise should, the thinking goes, be broken down so the university better fits a world that the disciplines fail to address. The academy ought to be shaped not to explain what the world is but to supply what the world demands. The difference is between an epistemological and an instrumental rationale. And with this difference, important norms are breached or abandoned. These norms vary by discipline. With respect to the humanities, the first that usually gets mentioned is the norm of deliberativeness much heralded in recent attempts to value the “slow” nature of what we do or to define the literary disciplines in particular around an ideal of attention. At ostensible odds with corporate values of efficiency, speed, and responsiveness, the humanities on this view value a contrary pause over what might otherwise get passed by, what might require linguistic or historical or formal training of one or another kind.

A related norm, perhaps less easy to see and less prone to (pardonable) sanctimony, is that of the open question, a tolerance for letting some difficulties stand once they are articulated. One reason to bust up a silo is that it doesn’t offer a *solution* to the “issues” plaguing us, from climate change to disease and beyond. Humanists’ intuitive rejection of this sort of language reveals an important, if tacit, norm embodied in the fine grain of literary-critical writing especially: the hard-to-shake draw to the intractable, the sense that the goal is to state and explore problems rather than solve them.

Not all challenges are new, nor is every problem solvable. The intuitive resistance to utility, moreover, derives from the pluralism of the disciplines themselves. A respect for the diversity of the world entails both that what the literary disciplines study is real and meaningful and that it ought to be studied on its own terms. Literary works and other cultural artifacts of course address topics that are of interest to the broader academy, but they don’t tend to resolve them — or not in the same way that the sciences or engineering do.

To pick an example from my own research interests, writers from Jonathan Swift to Tom McCarthy have taken up the problem of consciousness — how can sentience arise from mere matter — which is of vital interest to philosophy, neuroscience, and beyond. But no matter how hard literary critics were

to bear down on their texts, we would be unlikely to crack this problem as formulated by these other disciplines. Instead, critical method, like the texts it studies, would likely keep the problem open, poke around its edges, ask whether it has been framed in the right way, resituate the conversation.

The defense of disciplines is neither conservative nor elegiac. It is a defense of a vision of the world as itself plural.

That does not diminish the importance of humanistic disciplines or their objects of study. Rather, it reveals something important about both. Literary criticism aims to tell truths about its special objects — texts and other cultural artifacts — but these objects don’t do their truth-telling work in the same way as the sciences. Accordingly, critical method doesn’t have the same procedures or norms of explanation that the methods of the sciences have, although it is no less rigorous and no less accountable to standards of evidence, perspicuity, and elegance. That this is so should be the spur to a conversation among disciplines based on mutual esteem. With respect to a topic like consciousness, after all, literature and criticism ask their questions in the language in which the phenomenon — lived experience — takes shape and appears to us in its various forms and locations. Philosophy and science quite often do not.

A common argument against disciplines opens with the premise that some are closer than others to the fundamental nature of the world. On the more radical end of this view, only the natural sciences get at truths about the world, and other disciplines should exist only insofar as they are coordinated with these truths. Interdisciplinarity in this case means reducing the methods, arguments, and norms of one discipline to the supposedly more grounded picture of another. Such reductionism assumes a unity of knowledge across the academy and asserts the priority of basic science as the foundation of everything else. There is only the world of nature, in this view, and so every explanation of that world must eventually converge with its fundamental units of life if not its fundamental units of matter. The point of any academic discipline is therefore to perform a reduction that would in some fashion express this underlying unity and order.

This model found its early and decisive articulation in the famed entomologist E.O. Wilson's call for "consilience" among disciplines, a term he retrieved from the 19th century to describe a "dream of unified learning ... 'jumping together'" the fields of knowledge "by the linking of facts and fact-based theory across disciplines to create a common groundwork of explanation." The idea is that there is ultimately just one object and one method of study: the world of living creatures and the science by which it is explained. We only need some time to get the structure of learning in place so that "sound judgment will flow easily from one discipline to another" and the distance between them will gradually disintegrate.

Considered in this fashion, the history of the disciplines tells a story of their lamentably fragmented knowledge and, at the same time, their steady convergence into a unity, as the insights of the more foundational fields travel upward, limit, and reshape the explanatory frameworks of the fields they support: to wit, biology transforms psychology and psychology the humanities.

The vision can sound messianic: "We are approaching a new age of synthesis, when the testing of consilience is the greatest of all intellectual challenges." But the ultimate upshot beyond Wilson was to provide a picture of interdisciplinary inquiry that would take the claims of the humanistic disciplines to task by testing them against the ostensibly more grounded claims of the sciences, a kind of unity by reprimand.

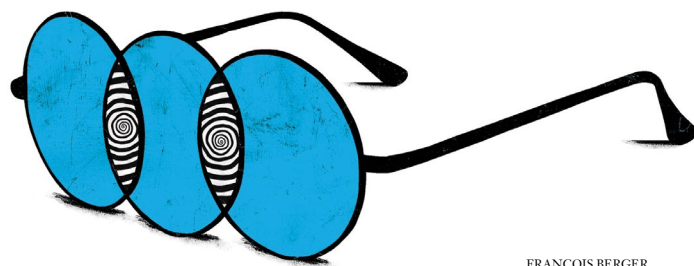
So, for example, in a study that defines consilience as the "vertical integration" of disciplines, Edward Slingerland argues that "humanists need to start taking seriously discoveries about human cognition being provided by neuroscientists and psychologists," discoveries "which have a constraining function to play in the formulation of humanistic theories." In what does this constraining relation consist? The answer will be familiar to anyone acquainted with the usual obloquy: "Bringing the humanities and natural sciences together into a single, integrated chain seems to me the only way to clear up the current miasma of endlessly contingent discourses and representations of representations that currently hampers humanistic inquiry."

This swipe at the humanities is less interesting for its by now hoary content than for the imaginary relation among disciplines from which it is derived. On the model of vertical integration, the natural sciences would lie beneath and limit the disciplines built on top of them because they are closer to every discipline's common point of reference. Human behavior explained by sociologists, for example, would refer to and be limited by the explanation of the same behavior studied by biologists. Nearer to home, written or performed phenomena studied in literature departments would refer to and be limited by the cognitive or neural explanation of

the same, and so on. The more fundamental the part of the world, the more fundamental its discipline of study. Pinker's shot across the bow of the humanities is just a further instance of this argument, coarsened with the corporate language of silo-busting.

The mistake is to conceive of the disciplines and the relations among them against a common point of reference: the physical or biological world, explained by basic science. The point is of course not to dispute that the fundamental constituents of the universe are physical and its units of life biological. But not every part of the world can have a physical or biological explanation. That is why we have disciplines in the first place. The behavior depicted in novels, say, cannot be explained by biology because fictional characters are not biological creatures. The world made present by poetry cannot be explained by physics or botany because it is not exactly physical, or not in the same way, and its flowers are not real flowers. Reading is not the same as seeing, nor writing the same as thinking.

Pace Slingerland and Pinker, the world studied by the academic disciplines is irreducibly plural: Minds and behavior, literature and literary history, cells and organisms, mark out separate kinds of things with different constituents in play and varied techniques for their explanation. This account is just as committed as the reductionist one to a picture of the world and is no less principled in elaborating its stakes. These begin with what the philosopher of biology John Dupré has called "the disunity of the sciences," namely, "the denial that science constitutes, or could ever come to constitute, a unified project" because "the extreme diversity of the contents of the world" requires an extreme diversity of aims and methods for its accounting.



FRANÇOIS BERGER
FOR THE CHRONICLE

Despite all the fanfare about the brain over the past several decades, for example, it has proved difficult to reduce psychology to neuroscience. "Suppose the functional correspondence of the nervous system crosscuts its neurological organization (so that quite different neurological structures can subserve identical psychological functions across times

or across organisms),” Jerry Fodor asked in “Special Sciences: (Or, the Disunity of Science as a Working Hypothesis)” (1974), his landmark demarcation of the natural and social sciences. “Then,” he answered, “the existence of psychology depends not on the fact that neurons are so sadly small, but rather on the fact that neurology does not posit the natural kinds that psychology requires.”

Psychology should proceed without expecting to be reduced to neuroscience because it explains something other than the brain. And indeed it has. Conclusions in the language of the first have not been consistently reached from research in the language of the second, although of course links between the two have been far-reaching and significant. The work in cognitive science and philosophy of mind I have found most relevant to literary analysis, for example, takes as its basic premise that consciousness and perception cannot be reduced to events in the brain. The failure of reduction is the spur to knowledge, not its disappointment.

If the world described by the sciences fails to exhibit a unity, there is little reason to believe that the world traditionally considered beyond the interests of science — the humanities — should be any different. The argument from disunity supposes that there are disciplines because of the way that the world is structured. It supposes that one discipline fails to reduce to another because the world explained by the disciplines is plural in kind, containing many varieties of things, from millipedes to minuets. These things don’t dissolve into something else on closer inspection. As the philosopher of science Anjan Chakravartty has put it, the “different domains of inquiry ask different questions regarding different entities and processes, and there is no evidence to suggest that facts at ‘higher’ levels of description are generally and in principle capable of being expressed in terms of facts about entities and processes at ‘lower’ levels. ... There are many ways one might carve nature at its innumerable joints.” Interdisciplinary reductionism idealizes the sciences, and yet it turns out that the reductionist program is not the way actual science works.

Every discipline has an evolving set of terms, skills, and norms established over time and in relation to its evolving domain of study. For literary studies, these would be the practices of disciplinary reading along with their associated lexicon of form, style, or genre and their associated norms of attention, rigor, historical grounding, and so on. If interdisciplinarity is to be worthwhile, it must bring these methods and norms into some relation to those associated with other domains of study — but the relation cannot be one of mere translation or reduction. An interdisciplinarity worth having is possible only with the background recognition that a pluralism of phenomena entails a pluralism of methods and norms, each adequate to its subject and none intrinsically better than another.

The humanities, like other fields of study, tell us important truths about some parts of the world. Disciplinary diversity is grounded in a pluralistic vision of things. But such pluralism necessarily produces tensions among different methods and truth claims. The best interdisciplinary humanities work confronts these tensions head on. Consider what happens when the literary critic Angus Fletcher and his coauthor, the cognitive scientist John Monterosso, examine the relationship between the literary device of free indirect discourse and the psychology of empathy.

Free indirect discourse is the literary technique in which a third-person narrator seems to slide into the perspective of a character without changing the tense or grammar in which the story is being told, such as when the narrator of Jane Austen’s *Emma* shows the reader how the eponymous protagonist perceives her new friend Harriet: “Those soft blue eyes and all those natural graces should not be wasted on the inferior society of Highbury and its connections. The acquaintances she had already formed were unworthy of her.” Since it allows us to view the world from the point of view of a character with a lighter touch than such devices as interior monologue, free indirect discourse is one of the novel’s best strategies for presenting what a character is thinking. For that reason, it has caught the attention of scholars interested both in how novels elicit empathy for characters on the page and whether reading novels can make one a more empathetic and thus perhaps a more ethical person. According to Monterosso and Fletcher, recent “scientific” attempts to answer these questions usually treat the device as a third-person “pivot” to first-person experience and so as a way to understand a character’s thoughts as they are expressed in her own private language.

Fletcher and Monterosso’s own analysis of free indirect discourse reveals instead that the form often holds several centers of consciousness in tensile balance, including, in their example from Austen’s *Pride and Prejudice*, the “gently ironic” perspective of the narrator along with the character’s own self-mockery. The difference between the two analyses seems to emerge from where the specialist attention falls: on experimental design suited to multiple subjects or on discrete sentences examined in their larger contexts (the paragraphs, chapters, or novels in which they appear).

For Fletcher and Monterosso, interdisciplinary collaboration allows them to move from an understanding of what free indirect discourse often entails to an experiment designed to measure its effects. Shifting between the protocols of different disciplines requires a balance of distinct notions of evidence and persuasiveness, as well as what counts as truth. The result in this case is an important hedge on the notion that the novel elicits empathy and an important pause on the

recruitment of reading for ethics.

In the experimental design characteristic of the sciences, there is a premium on simplicity — variables must be minimized and noise filtered out. In contrast, the sort of attention paid to free indirect discourse — or any elemental dimension of literary works — adds complicating variables to arrive at its truth claim. In their discussion of the Austen example, Fletcher and Monterosso first expand the citation from two sentences concerning Mrs. Bennet's response to learning that Charles Bingley will attend the next assembly to the entire paragraph from which the sentences are taken and then outward even further, to aspects of plot and the history of marriage, gender, and power. Their claim to a persuasive truth depends on the explanatory rigor of literary critical method. One distinctive feature of this method is that it scales up the level of complication while remaining internally coherent, coordinating features of syntax and tone with dimensions of historical and narrative situation. The word for this kind of scaling and this kind of explanation is of course "reading."

On a highly idealized picture, disciplines that minimize variables find it easier to agree on truth claims and thus, in their view, to build knowledge over time than disciplines that scale upward in the effort to be persuasive. The sheer variety of factors that can go into or be left out of an influential reading means that the literary disciplines are prone to what might seem from the outside to be a circular eclecticism and heterogeneity, periodically redefining their interpretations or even their core concepts with little convergence or accumulation. Such eclecticism should not detract from the discipline's claims to say something true about the world. Rather, it should reveal something import-

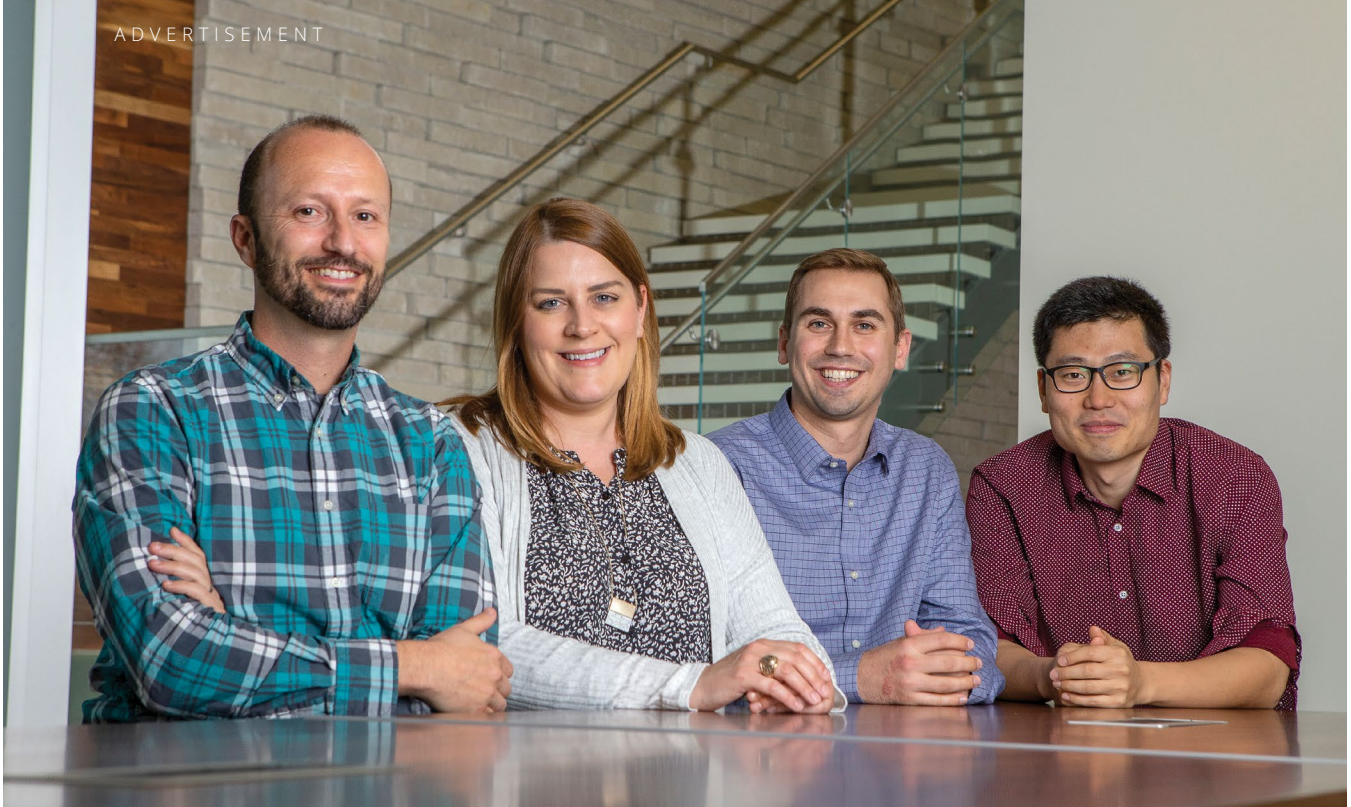
ant about criticism as a method, its movement from individual artifacts to explanations that hold across forms, genres, and contexts.

If the rationale for any explanation is that it "makes the world more intelligible," as Michael Friedman put it in his classic discussion "Explanation and Scientific Understanding" (1974), this is because the explanation takes up what some part of the world is, both the nature of its composition and the demands for its understanding. What a discipline endeavors to understand cannot be reduced to something unrecognizable in its own language, as in some of the more regrettable attempts to apply evolutionary psychology to literary interpretation or aesthetic theory. Recognizing this, scientists themselves abandoned the reductionist program long ago. It is something of an irony then that reductionism has returned in the effort to diminish the value of humanistic thinking.

If we are to be "scientific" about literature and art, we need to understand their place in the diversity of the world. If we are to be interdisciplinary, we require a model of interdisciplinarity that respects the character of disciplines at a moment when their independence is under attack. The defense of disciplines is neither conservative nor elegiac. It is a defense of a vision of the world as itself plural. For those involved in decisions about the future of higher education, such pluralism is the best way to secure truth amid peril.

Jonathan Kramnick is a professor of English at Yale. This essay is adapted from Paper Minds: Literature and the Ecology of Consciousness, from the University of Chicago Press.

Originally published October 11, 2018



From left: Cedric Geoffroy, Jen Dulin, Dylan McCreedy, Hangue Park

Texas A&M Research Holds Great Promise For Patients With Spinal Cord Injury

An interdisciplinary team of scientists assembled by a “cluster hiring” initiative are combining diverse expertise in hopes of helping people with the devastating injury.

When Dylan McCreedy was 18 months old, he was hospitalized for several weeks with spinal meningitis. Left untreated for more than a few hours, the infection involving the fluid and membranes around the brain and spinal cord can cause brain damage and even death.

McCreedy survived the painful experience, though it resulted in severe hearing loss in his right ear. His struggle became his motivation, prompting McCreedy, an assistant professor of biology, to pursue an academic research career focused on finding new treatments for spinal cord injury (SCI).

Joining what’s called a “cluster hire” along with McCreedy were Jennifer Dulin, assistant professor in the Department of Biology, College of Science; Cédric Geoffroy, assistant professor in the Department of Neuroscience & Experimental Therapeutics, Health Science Center; and Hangue Park, assistant professor, Department of Electrical Engineering, College of Engineering.

Each researcher is approaching SCI using his or her unique expertise. Dulin is working on an experimental strategy to replace the nerve cells (neurons) that are lost due to injury or degenerative disease with neural stem cells, which are immature cells capable of regrowing new tissue, while McCreedy is developing neuroprotective therapies that can be applied early after injury in the hospital or on the battlefield. Geoffroy is discovering and testing novel gene therapy approaches to promote regrowth of injured nerves, and Park is engineering cutting-edge devices to functionally stimulate the injured nervous system.

Unlike other organs of the body, the brain and spinal cord do not regenerate after injury.

“Spinal cord injury profoundly affects the lives of the patient, as well as the family,” McCreedy said. “It is a great financial burden and irrevocably affects quality of life.”

“There is a great deal of collaboration between our four labs as well as other spinal cord injury research labs at Texas A&M. We are all working together to combine our distinct approaches in order to advance toward powerful new treatments.”

The cluster hire was made possible by a gift of \$1.4 million to Texas A&M from The Institute for Rehabilitation and Research (TIRR) Foundation, a nonprofit organization dedicated to improving the lives of people with neurotrauma and neurodegenerative disease. The donation supported the hiring of four scientists working in the area of spinal cord injury research.

More than 250,000 people in the U.S. are living with paralysis from SCI, while 17,000-plus new injuries are reported annually, according to the National Spinal Cord Injury Statistical Center (NSCISC). Individuals with SCI incur up to \$1 million in healthcare and living costs in the first year alone and upwards of \$5 million in lifetime expenses. Patients have a reduced life expectancy and many suffer from chronic pain for which very few treatment options are available. These debilitating injuries cost the U.S. health care system \$40.5 billion annually. Most new SCI cases — about 78 percent — are male patients and most are caused by vehicle crashes, followed closely by falls, NSCISC reported.

The great advantage of this research endeavor at Texas A&M lies in its interdisciplinary nature — a hallmark of cluster hiring.

“In many cases, cluster hires are spearheaded by a single department looking to build strength in a particular research area. In contrast, multiple colleges at Texas A&M participated in our cluster hire,” said Dulin, who earned her bachelor’s degree in biochemistry from Texas A&M in 2005. “In our case, the initiative to recruit a group of new faculty with diverse research approaches worked beautifully.

“There is a great deal of collaboration between our four labs as well as other spinal cord injury research labs at

Texas A&M. We are all working together to combine our distinct approaches in order to advance toward powerful new treatments.”

McCreedy agrees, saying the researchers have complementary expertise and the collaborative nature of the project advances the capabilities of all of the labs involved.

“In addition, it has provided national recognition for Texas A&M as a strong environment for spinal cord injury research,” he said.

Additional Texas A&M collaborators include researchers at the College of Liberal Arts, the College of Veterinary Medicine & Biomedical Sciences, as well as the Texas A&M Institute for Neuroscience.

SCI is a complex problem with no single “magic bullet” cure, Dulin said, but interdisciplinary research is one of the most powerful weapons in the fight. Clinically successful therapies will most likely require combined treatments targeting multiple aspects of disease pathology ranging from protective therapies in the very early stage to rehabilitative therapies years after injury.

“Testing these kinds of combinatorial approaches would be exceedingly difficult without an environment of diverse spinal cord injury research expertise,” Dulin said. “This is a huge advantage of the spinal cord injury cluster hire at Texas A&M – it has brought together a group of scientists with unique backgrounds and highly diverse expertise who are united in our commitment to developing better treatments to improve the quality of life for these individuals and their families.”

From breaking news to key insights to real-world advice, *The Chronicle of Higher Education* is dedicated to serving academic leaders and professionals. Our newsletters, subscriptions, special reports, and exclusive data projects provide a comprehensive view of the latest trends and critical issues affecting academe. For more than 50 years, higher-education professionals from around the world have trusted *The Chronicle's* in-depth reporting and analysis to understand their world and make informed

THE CHRONICLE OF HIGHER EDUCATION®

THE CHRONICLE
OF HIGHER EDUCATION.

1255 Twenty-Third Street, N.W.
Washington, D.C. 20037
202 466 1000 | [Chronicle.com](https://www.chronicle.com)