

### “The Excitement of Science”

IN THE FALL of 2003, Juliet Girard '07 arrived at Harvard with first-rate scientific ambitions and a second-rate education. She had grown up in Jersey City and taken classes at a large public high school—it was “pretty bad,” she says—before making the geographic and intellectual leap to Cambridge. The transition was difficult, but not because she couldn't manage the coursework. “I really had a hard time,” Girard explains. “I didn't know people who came from similar economic backgrounds.” The concern wasn't purely social: like many students on financial aid,

she had strict term-time and summer earning requirements. Girard was afraid she wouldn't find enough earning opportunities to carry her through all four years.

One thing she did have, though, was a strong interest in the life sciences. Girard had spent a summer during high school working at a plant-breeding laboratory at Cornell, where she acquired a taste for the rhythms and methods of research. She thought she'd like to sustain this experience through college. Shortly after she arrived in Cambridge, Cabot professor of biology Richard M. Losick invited her to apply to a research-education program he had recently developed to support disadvantaged students interested in science. A few months later, Girard was working

as a researcher in one of the University's most illustrious cellular-biology laboratories. She has not worried about meeting her financial-aid earnings requirements since then.

Girard is one of about two dozen students in a program Losick developed in 2002 with a million-dollar grant from the Howard Hughes Medical Institute (HHMI). His goal is to place passionate but disadvantaged young life scientists in top labs where they can perform actual research (instead of cleaning beakers). He also provides enough financial support that they don't have to hold other jobs. Losick sees the program as preventive: he is afraid of letting a brilliant scientific mind fall through the cracks because of a

### Business School's Guiding Light

**Jay O. Light**, an expert in finance and investment management, was named dean of Harvard Business School (HBS)—the ninth since its founding in 1908—by President Lawrence H. Summers on April 24. Light, D.B.A. '70, had been acting dean since August 1, 2005, after the departure of Kim Clark, who left to head Brigham Young University-Idaho. Although the search for a permanent successor was well under way when Summers announced his intention to resign, he consulted on Light's selection with the Corporation and also with incoming interim president Derek Bok.

Stressing continuity despite the change in the school's leadership, Light vowed to “keep the school at the leading edge of innovation in management education.” As senior associate dean, he worked closely with Clark on strategic planning and new initiatives, and he indicated that they had largely agreed on “the challenges that this institution faces.” Among those is the need “to make sure that our research agenda is exploring [and responding to] the changing nature of business around the world,” he said at a press conference following the announcement of his appointment. Since 1999, as part of its globalization strategy, HBS has opened five new international research centers that support “active programs of faculty research and case-writing”—the fruits of which become “part of our educational programs here.” The school also has an active program of “joint-venturing” with other business schools around the world, particularly in China. (It even produces cases and books in Chinese through its publishing arm.) But Light also stressed the importance of opportunities to collaborate “here at home” with other schools at Harvard. Given the opportunities to improve the management of healthcare organizations and healthcare delivery—a significant and growing component of the economy, he noted—“We have launched this year a joint M.D.-M.B.A. program with the medical school,” as well as “a health-

care initiative jointly with the medical school faculty.”

Light, the Robinson professor of business administration, graduated from Cornell in 1963 with a degree in engineering physics. He worked at the Jet Propulsion Laboratory at Caltech and in management consulting before joining the HBS faculty in 1970, and has since held numerous senior management positions within the school. His professional, research, and teaching interests have focused on capital markets and institutional asset management, including the management of pension funds and endowments, as well as on the entrepreneurial management of technology companies. During a leave of absence from 1977 to 1979, Light was director of investment and financial policies for the Ford Foundation. He is now a director of Harvard Management Company, which oversees the University's endowment, and of Partners HealthCare, which operates Massachusetts General and Brigham and Women's Hospitals. He also chairs Partners' investment committee.

Describing Light as a person of exceptional integrity and judgment, Summers said: “In his own career as a teacher, case writer, and a scholar, and as a counselor to this organization and others, [Jay] embodies what is best about the Harvard Business School. He is...an outstanding citizen not just of this school but of the entire University.”



Jay O. Light

STUART CAHILL

less-than-privileged background. “Arguably, no one who is admitted to Harvard is disadvantaged,” he explains. Still, not all advantages are created equal. Those whom he selects often come from inner-city schools with limited resources or from less affluent countries. According to Losick, many of them might otherwise be deterred from pursuing a science degree. “In my experience, these students are at the highest risk,” he says. “They find themselves falling behind and don’t have a good feel for the excitement of science.”

Losick is something of a romantic about “the excitement of science,” and, like many romantics, he is wary of institutionalization. His program for disadvantaged students (which HHMI will continue funding for the next four years with a \$500,000 renewal grant) was the centerpiece of a three-pronged effort to get back what’s often lost in the lecture hall: he is trying to bring a seasoned researcher’s excitement to greenhorn undergraduates. Faculty members, who regularly move among Harvard’s classrooms, laboratories, and offices, know that different work goes on in each of these places, but the difference is not always so apparent to undergraduates. “Being a scientist and doing science is very different from being a student and doing coursework,” Losick explains. “I think they sometimes confuse taking exams and going to lecture and doing courses with science.” The way around this misconception, he maintains, is to show students what’s going on at the research vanguard.

With this in mind, Losick, who in 2002 was named a Harvard College Professor for excellence in teaching, has helped develop a new undergraduate research course and incorporate nontraditional teaching tools, like animations and instant-feedback technology, into his own lecture classes. Meanwhile, the recent announcement of a new, integrated undergraduate curriculum in the life sciences—much of which bears Losick’s imprimatur—has turned the approach of his four-year project into a cornerstone of Harvard’s latest science instruction.

AT HARVARD, laboratory research is traditionally the endpoint of training, not its origin. Losick doesn’t think it should be

## Decanal Duo

**Kathleen McCartney**, Lesser professor in early childhood development and since July 2005 acting dean of Harvard Graduate School of Education, was named to the deanship on May 16 by President Lawrence H. Summers. McCartney, who earned her Ph.D. in psychology from Yale, has focused on interactions among childcare, parenting, and poverty in her research. She joined the faculty in 2000 and served as academic dean during the 2004-2005 year. A more detailed profile will appear in a future issue.

Separately, interim president Derek Bok named Jeremy R. Knowles interim dean of the Faculty of Arts and Sciences (FAS) after conferring with a 10-member faculty advisory committee and consulting junior professors and the graduate and undergraduate student councils. Knowles, Houghton professor of chemistry and biochemistry, was previously dean from 1991 until William C. Kirby took office in July 2002. In making the appointment on May 22, Bok said, “A term as interim dean does not allow the luxury of learning on the job, and no other individual rivals Jeremy in his experience of FAS affairs or his capacity to begin immediately to address important administrative issues while maintaining forward motion” on matters ranging from the undergraduate curriculum review to Allston planning. Knowles, reflecting on his and Bok’s second turns at their jobs, wrote to the FAS faculty and staff, “In the light of his own generous decision, it was, of course, impossible for me to look President Bok in the eye and say ‘No.’” He would have to discover, Knowles wrote, “where things stand (academically, financially, and in spirit),” and encouraged colleagues to let him know.



Kathleen McCartney



Jeremy R. Knowles

so. His premise is that the demands of actual research—designing experiments, analyzing data, and recalibrating hypotheses—can be teaching tools at all levels. Pedagogically speaking, he’s playing with an old deck, but he’s shuffled the cards into a new sequence. This makes for a very different game.

For one thing, Losick, who is co-head tutor in biochemical sciences, has tried to front-load the undergraduate curriculum as much as possible. Rather than save the most exciting material for higher-level classes, as a reward for students who persevere, he and many of his colleagues try to integrate it into introductory courses to entice students to explore further. Losick’s own Biological Sciences 52, “Introductory Molecular Biology,” puts a premium on interaction and engagement. He’s used part of his HHMI grant to hire a graphic artist, Matt Bohan, to make dynamic computer animations of molecular processes. These are ideally suited for

teaching molecular biology, he says, because they let him show how several distinct processes—like the unzipping of a DNA strand and the pairing of its bases—work together. “If you’re trying to teach something that is dynamic on a blackboard, it’s hard to do,” he explains. “With an animation, I can show things in motion, and also I can layer.”

He also tries to keep tabs on students’ progress during the lectures themselves. By distributing “personal response devices,” invented by McKay professor of applied physics and of physics Eric Mazur (“Outside of Harvard, it’s frequently called a clicker,” Losick deadpans), he can instantly monitor how the class responds to a given problem. “If I haven’t done a good job,” he says, “I can re-explain the material.” The goal is to move away from a muddled textbook-level understanding of biological processes and toward the dynamic understanding of a scientific professional.

DINA KONOVALOVA DREAM PICTURE

JON CHASE/HARVARD NEWS OFFICE

## Yesterday's News

From the pages of the *Harvard Alumni Bulletin* and *Harvard Magazine*

**1916** The Faculty Committee on the Use of English by Students reports that undergraduates "write bad English because of sheer ignorance. Errors in spelling, punctuation, grammar, and sentence structure abound...the influence of bad school training and years of indifference."

**1921** The *Bulletin's* editors criticize the University for merely "welcoming" Marie Curie to Cambridge three days before Commencement, rather than awarding her an honorary degree as Yale and other institutions have done. "To pay this honor to any woman," they note, "would of course have been an innovation at Harvard, but it is an innovation which sooner or later is bound to come, and to associate it with such an event as the discovery of radium might have gone far to justify it."

**1941** In the face of impending war, 70 Harvard students and 40 Yalies spend six summer weeks in joint training at the Field Artillery ROTC Camp in Underhill, Vermont.

**1956** John F. Kennedy '40, the main Commencement speaker, notes a gap growing between intellectuals and politicians. He recalls that the nation's first great politicians were also writers and scholars, citing Thomas Jefferson, described by a contemporary as "a gentleman of 32, who could calculate an eclipse, survey an estate, tie an artery, plan an edifice, try a cause, break a horse, dance a minuet, and play the violin."

**1961** Harvard hosts preliminary training for 38 Peace Corps candidates bound for two years in Nigeria.

**1966** Adrienne Rich '51 becomes the first woman to deliver a Phi Beta Kappa poem at Harvard. Her defense of artists' right to speak out on political matters, notably Vietnam, draws some boos.

**1971** Harvard's air force and navy ROTC units commission their last officers the day before Commencement. (The army unit left in 1970.)...Derek C. Bok becomes the twenty-fifth president of Harvard, the first since 1672 who is not a graduate of the College.

**1976** A special loan plan is established to help parents otherwise ineligible for major financial aid pay for their children's education at Harvard-Radcliffe as the College year's price tag rises to \$7,360.



In some cases, this effort has impelled Losick to move past the classroom entirely. When a few students, like Jillian Spangler '06, entered BS 52 with previous laboratory experience, Losick allowed them to skip the weekly course lab sections and do research, in his own laboratory, that generated new and valuable data. They were *doing* science, rather than simply learning it—all while getting to see what their professor did outside the lecture hall. "It gave me a very good chance to get to know him," says Spangler, who plans to begin doctoral work in organic chemistry this fall at Princeton. "We became very good friends."

She also took advantage of other research opportunities that Losick has helped to organize within the curriculum. Spangler enrolled for the inaugural semester of Molecular and Cellular Biology 100, a course Losick designed with Robert Lue, who is executive director of undergraduate education in molecular and cellular biology. MCB 100 is a course based entirely on research: students pick a topic that interests them and pursue it, in groups, as part of a larger faculty project. It's an opportunity many might not otherwise see until graduate school. Unlike a graduate research track, though, MCB 100 offers an overview of several different projects; each group shares its progress with the class as a whole. Students make their own schedules and conduct most of their work in Harvard's teaching laboratories, newly renovated and equipped with a combination of University and HHMI funds. The students learn, in effect, how to teach *themselves* science.

LOSICK'S PROGRAM for disadvantaged students rests at the point where this new pedagogy meets the world outside Harvard's gates. He actively recruits freshmen every fall, drawing a list of possible candidates from the College admissions office and identifying students who are interested in science but have performed poorly on their placement exams. He advertises the

program among Yard proctors and first-year advisers. In choosing among applicants, Losick favors enthusiasm over achievement. "I assume that any student admitted to Harvard is smart," he says. "I want to find who's motivated."

James Sawalla Guseh II '06 heard about Losick's program from his freshman proctor. He had done laboratory work at Duke and Chapel Hill in high school, and, on arriving at Harvard, mentioned that he might be interested in stem-cell work. Losick placed him in the lab of Cabot professor of the natural sciences Douglas A. Melton, a leading stem-cell researcher and co-director of the Harvard Stem Cell Institute, where he remained through graduation. Guseh's research in Melton's lab culminated in a biochemical sciences thesis investigating the formation of the lung through three sets of experiments. It recently won a Hoopes prize. Next year, Guseh plans to apply to graduate schools and to prepare some of his findings for publication. If it hadn't been for Losick's program, he says, he might have concentrated in government and gone to law school. "I've always had an interest in doing research that perhaps the program just nurtured," he explains. Because he earned part-time wages during the school year and full-time wages over the summer, he never needed to find a supplementary job.

Part of the reason the program works, Losick says, is that college students are a welcome presence in most faculty laboratories. "Professors already have postdocs who are experienced," he explains. "They want to take undergraduates in the lab

because they're smart and enthusiastic." He says he relishes his role as a "matchmaker" between students and colleagues, because what he's ultimately trying to build is a new sort of scientific community. For Juliet Girard—who has been working in the lab of MCB chair Andrew W. Murray, researching how microtubule tension is sensed during cell division—the program has offered a group of friends as well as financial support. "There's a strong sense of camaraderie," she says. "It's really felt like a community for me."

IT'S A GOOD TIME to be thinking about life-science education. A proposal enacted this spring divides the undergraduate concentrations of biology and biochemical sciences into five new specializations; these will join with three existing tracks to create an eight-part life-sciences cluster

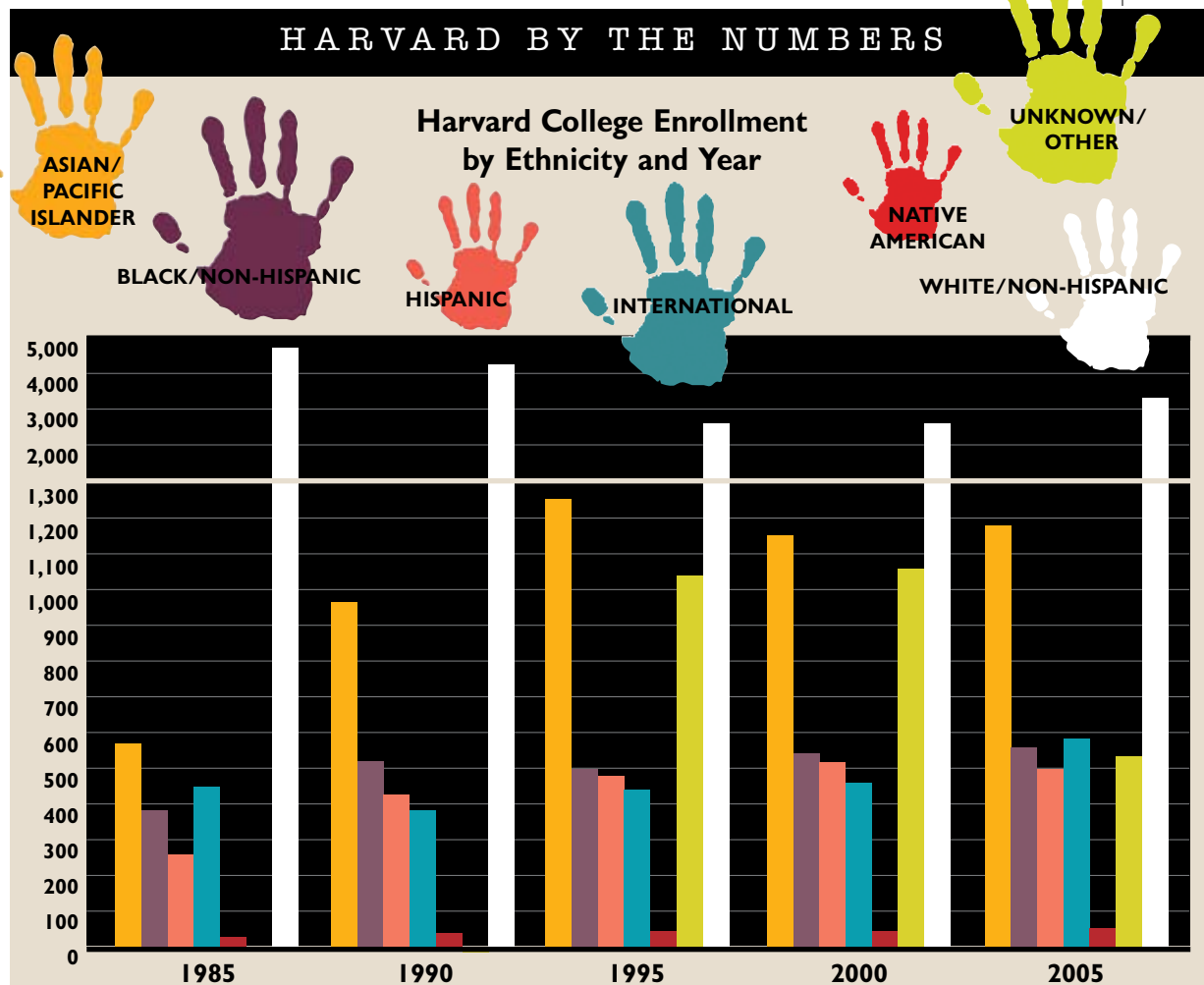
(see page 65). The new organization is intended to provide students with greater flexibility and closer contact with faculty advisers. It is not so surprising, then, that Losick's projects have helped set the tone for change.

Robert Lue describes Losick as "absolutely crucial" to the planning of the new concentration cluster—even

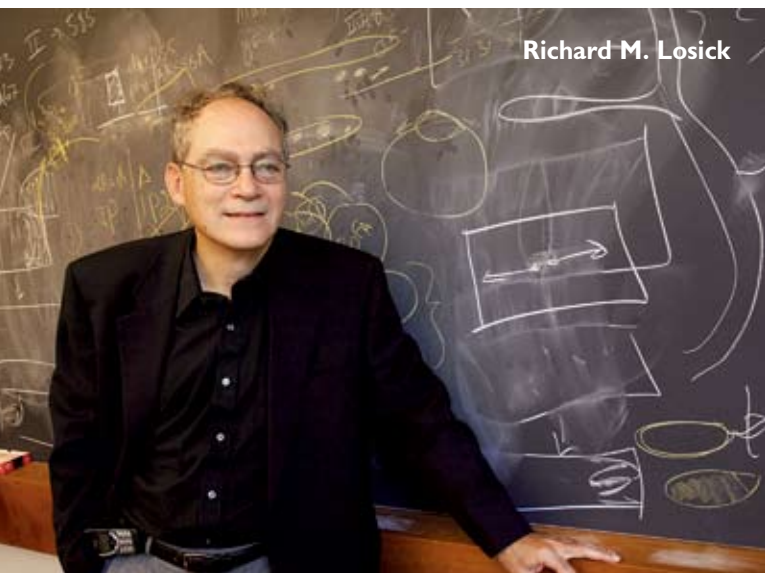


Juliet Girard

FRED FIELD



Source: Harvard Office of Budgets, Financial Planning, and Institutional Research



KRIS SNIBBE/HARVARD NEWS OFFICE

though it will dissolve the concentration he directs. "Other faculty were surprised by how open and not turf-oriented Rich was and is," Lue says. "Biochemical sciences is a jewel." Yet Losick's support makes sense. The new curriculum is based on a pair of common courses, Life Sciences 1a and 1b, that premiered this past year—Lue co-taught the former in the fall—and reflect the front-loaded, interactive approach Losick and Lue have been perfecting for years (see "Enlivening Science," July-August 2005, page 62). "Rich and I

which Lue says was developed in consultation with Losick and other experienced teachers on campus, offers an integrated introduction to biology and chemistry through "framing questions" based in recent, rather than canonic, discovery. (The course taught concepts in chemistry and biology, for instance, by examining how cancer and the HIV virus work.) Not only was enrollment 30 percent higher than its predecessor's, but attendance hovered at 80 percent through the semester—even though class was held at the student-un-

were very concerned about making the freshman experience both much more exciting for students and much more reflective of what is exciting in science today," Lue says. "You get them as first-semester freshmen and they develop an expectation for what a lecture course could be."

friendly hour of 9:30 a.m. and lecture videos were available on-line. "I've taught at Harvard for almost 20 years," Lue says, "and I've never seen such energy."

Losick says he expects the new life-sciences courses to have a "ripple effect" through the redesigned sciences, forcing higher-level courses to be reshaped in a similar vein. The prospect excites him. He also thinks the new concentration structures might open up space for more research earlier in the curriculum. "There's more talk of having more MCB-100-like courses in other fields," he reports.

Funding for Losick's disadvantaged-students program is uncertain—he hopes a benefactor will step in before 2010, when his renewal grant expires—but, for the moment, he likes meeting a new group of budding scientists every year and watching them pass on their experiences as they grow. "The idea is that the upper-level students would be mentors and role models for the lower-level students," he says. Whether this ideal holds up in practice, of course, is something that only time—and trial—will tell. —NATHAN HELLER

## Israel and Academia

On March 23, the *London Review of Books* published a long essay on "The Israel Lobby," by Harrison distinguished service professor of political science John J. Mearsheimer of the University of Chicago (a West Point graduate), and Stephen M. Walt, Belfer professor of international affairs at the Kennedy School of Government, where his term as academic dean concluded at the end of this school year. The paper explained a policy based on "unwavering support for Israel" that has "inflamed Arab and Islamic opinion" and "jeopardized" United States security. Rather than being based on "shared strategic interests or compelling moral imperatives," the authors found, the policy derives "almost entirely from domestic politics, and especially the activities of the 'Israel Lobby.'" That lobby, they wrote, campaigns to "quash debate about Israel" by such means as "organizing blacklists and boycotts—or by suggesting that critics are anti-Semites." Readers were referred to a longer, footnoted version at <http://ksg-notes1.harvard.edu/Research/wpaper.nsf/rwp/RWP06-011>.

Not to the authors' surprise, the paper provoked wide responses (initially in the *New York Sun* and then in foreign-policy centers worldwide)—many of them more focused on the authors' purported politics, or whether they or their argument were anti-Semitic, than on the substance of their claims. The Kennedy School welcomed scholarly responses, and Frankfurter professor of law Alan M. Dershowitz took the opportunity, pub-

lishing a 44-page "Debunking the Newest—and Oldest—Jewish Conspiracy" on April 5 ([www.ksg.harvard.edu/research/working\\_papers/abstract\\_dersh1.htm](http://www.ksg.harvard.edu/research/working_papers/abstract_dersh1.htm)). He heatedly characterized the Mearsheimer-Walt work as "little more than a compilation of old, false, and authoritatively discredited charges dressed up in academic garb" and "dependent on biased, extremist and anti-American sources."

As the debate toned down, its substantive weight increased. Tony Judt of New York University and author of *Postwar*, an acclaimed history of modern Europe, asked in a *New York Times* essay how future Americans would view the close alignment of "the imperial might and international reputation of the United States" with "one small, controversial Mediterranean client state" and suggested how other nations viewed matters today. *Columbia Journalism Review* contributing editor Michael Massing, writing in the *New York Review of Books*, criticized Mearsheimer and Walt for important flaws in their work and for their paper's "thin documentation"—and then proceeded, by detailed reporting, to suggest how the American Israel Public Affairs Committee (AIPAC) and related entities work and what the news coverage of controversy reveals. He concluded that the central Mearsheimer-Walt argument was "entirely correct," and that its flaws notwithstanding, their essay usefully opened for debate "a subject that has for too long remained taboo."