



Patrons will be able to enter Widener Library with a surer step once the entry stairs are reconstructed (opposite) with appropriately colored mortar (samples shown at left). The limestone capitals got a thorough cleaning, too.

Face-Lift

ITS STACKS, reading rooms, and offices already renovated, climate controlled, and rewired for the twenty-first century, the time had come to spruce up Widener Library's exterior, the most visible of campus building projects during the prime construction season from Commencement to Labor Day.

The cosmetic work turned out, unsurprisingly, to be a big job. Scaffolding covered the façade facing Tercentenary Theatre (the only side budgeted for treatment so far). A waterproof tunnel ascended the steps so scholars could gain safe access to the front door. The library's familiar face disappeared in a gauze of green netting, like a client undergoing an herbal treatment at a spa.

And so the washing began. The limestone capitals of Widener's massive columns were spray-saturated with water and then power-hosed to peel off grime. (Note to those summering outside Cambridge: the same process is being applied to the western wall of Grand Central Terminal in New York City.)

The brick walls were repointed where necessary. Like rotten teeth, corroded sections of the stone facing on the parapets flanking the wide entry stairs were chiseled out. The resulting gaps were repaired with a fresh limestone inlay, each piece carefully cut and fit, then delicately mortared into place.

The troublesome stairs, which have shed their grout almost annually, got a good working-over. Early in the project, workers chipped out some of the old joining material and mixed up new batches in a variety of tints (see photo,



above). A satisfactory mix having been chosen, the joints between every piece of granite were then cleaned out, repacked, and sealed anew. The three bottom courses were lifted out of place, reseated on more substantial subsurfaces, nudged back into position, and mortared home.

Will anyone notice next June, when Widener's steps are again covered with



Commencement throngs and the columns serve as outsized stanchions for crimson banners? Who knows? But the books within will be secure in a better-looking, more weatherproof Widener Library.

Educating Undergraduates

In the new academic year, the Faculty of Arts and Sciences (FAS) continues its review of the entire undergraduate curriculum. Many details remain to be studied, debated, and settled—among them, the shape and uses of a new calendar with semesters separated by a “January term,” and the kinds of international experiences the College will encourage students to pursue. Background materials are available at www.fas.harvard.edu/curriculum-review/.

But if faculty comment so far is any indication (see “Addition by Subtraction,” July–August 2004, page 55), the most important discussions may emphasize broad matters: Harvard’s vision of undergraduate learning, its definition of general education in the twenty-first century. To encourage readers to weigh in, Harvard Magazine here

offers views of general education from six and three decades ago, in the periods following World War II and during and after the Vietnam era. These materials are followed by brief comments from three senior faculty members about a possible basis for general education today, learning in the humanities, and the challenges of education in the sciences. Dean William C. Kirby has encouraged comment by one and all at curr-rev@fas.harvard.edu.

~The Editors

General Education

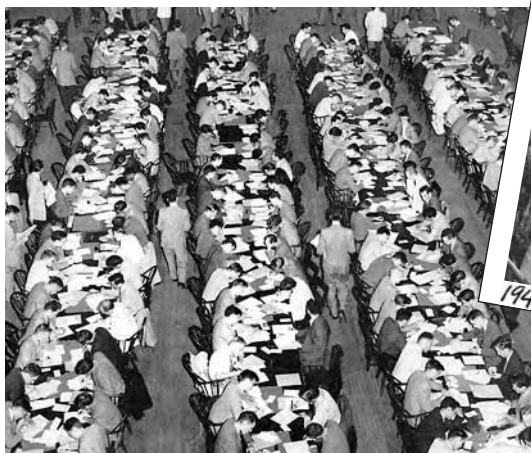
HARVARD'S UNDERGRADUATE “Gen Ed” curriculum was conceived in *General Education in a Free Society*, the 1945 report of an academic committee established two years earlier by President James Bryant Conant. It reflected concerns that Depression-era circumstances had led students to specialize and preprofessionalize their studies, and that distribution requirements had

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deteriorated in practice. More broadly, it reflected the perceived challenges to modern, Western civilization from economic collapse and the catastrophe of World War II. The report, known as the "Red Book," was widely disseminated and influenced education nationwide.

"The present system of concentration and distribution in Harvard College affords rich opportunities for specialization and, therefore, for differentiation," the committee wrote. "But it is weak indeed in the opportunities it provides for the development of a common body of information and ideas which would be in some measure the possession of all students." In pursuit of such a "substantial intellectual experience common to all Harvard students," the report recommended that, alongside their chosen concentrations, six of the 16 courses then required of undergraduates be devoted to general education, with at least one each in humanities, social sciences, and sciences. Three would be introductory, and three more advanced. The required humanities and social-sciences classes would furnish that common core, "as well as introductions to the study of the traditions of Western culture and to the consideration of general relationships." And so were born such legendary courses as "Western Thought and Institutions," taught by government professor Samuel H. Beer, LL.D. '98.

The Gen Ed curriculum was in place from 1951 until the Core succeeded it in 1979-80. The discussions underlying it still resonate whenever curriculum reform looms. Fundamentally, "The term, general education, is somewhat vague and color-



less; it does not mean some airy education in knowledge in general (if there be such knowledge), nor does it mean education for all in the sense of universal education. It is used to indicate that part of a student's whole education which looks first of all to his life as a responsible human being and citizen; while the term, special education, indicates that part which looks to the student's competence in some occupation," though the authors were at pains to stress that the two parts of learning "are not entirely separable."

The challenge to general education, they noted, resides in the practical and intellectual rewards of "specialism"—occupational success and the pursuit of new knowledge. In "an age of specialism" as "the means for advancement in our mobile social structure," the committee wrote, "we must envisage the fact that a society controlled wholly by specialists is not a wisely ordered society." Effecting the required balancing requires schools and universities to recognize that "Special education comprises a wider field than vocationalism; and correspondingly, general education extends beyond the limits of merely literary preoccupation."

Searching for some alternative to mere distribution requirements, given their view that general education is "an organic whole whose parts join in expounding a ruling idea and in serving a common aim," the committee distinguished between "liberalism in education and education in liberalism." Their ultimate goal for the traits "to be sought above all others in every part" of general education included the abilities "to



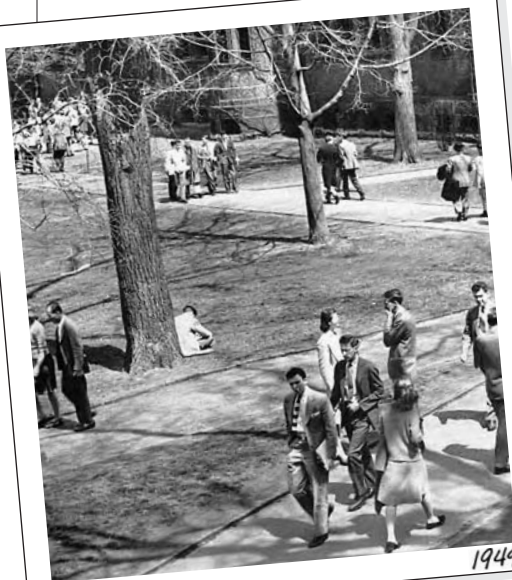
think effectively, to communicate thought, to make relevant judgments, to discriminate among val-

ues"—each as "an indispensable coexistent function of a sanely growing mind."

The Core Curriculum

AS DEAN of the Faculty of Arts and Sciences, economist Henry Rosovsky, Jf '57, Ph.D. '59, LL.D. '98, led the debate from 1975 to 1978 that produced the Core curriculum to succeed the General Education system put in place in the College following publication of the Red Book. In a 1990 memoir, *The University: An Owner's Manual*, he reprises a "standard for liberal education in our time" formulated in one of his annual dean's reports. Its five elements:

- "An educated person must be able to think and write clearly and effectively."
 - "An educated person should have a *critical appreciation* of the ways in which we gain knowledge and understanding of the universe, of society, and of ourselves"—involving at least "*informed acquaintance*" with mathematical and experimental methods of science; with historical and quantitative techniques employed in social analysis; with "important scholarly, literary, and artistic achievements of the past"; and with mankind's "major religious and philosophical conceptions."
 - "An educated American...cannot be provincial in the sense of being ignorant of other cultures and other times."
 - "An educated person is expected to have some understanding of, and experience in thinking about, moral and ethical problems."
 - "Finally, an educated individual should have achieved depth in some field of knowledge."
- Rosovsky stresses that any curricular



“requirements have to make sense in terms of a coherent educational vision” which the faculty can explain. The requirements should further fulfill “a most important educational function. They assist in creating an atmosphere of intellectual sympathy among extremely diverse students. Those with a passion for humanistic studies will have the opportunity to appreciate the beauties of scientific reason and proof” and vice versa (a goal he suggests the Core met, as initially designed). Finally, he summarizes the limits of curriculum: “The quality of instruction and pedagogical methods...are at least as important.” In this sense, and given the learning that students provide one another, “Curriculum is a skeleton. The flesh, blood, and heart [have] to come from the rather unpredictable interactions between teachers and students.”

Rosovsky also shares some of the broader principles that informed his own view of general education, within which the Core was shaped in a context of “unusually rapid growth of knowledge,” particularly in the sciences, and internationalization:

There can be no scientific definition of liberal or general education because education is not a science.... There is no single truth, but let me cite two views that I have found to be particularly congenial. First:

General education means the whole development of an individual, apart from his occupational training. It includes the civilizing of his life purposes, the refining of his emotional reactions, and the maturing of his understanding about the nature of things according to the best knowledge of our time.

We owe this fine statement written in 1946 to Howard Lee Norstrand, sometime professor of Romance languages at the University of Washington....[N]ote the key phrases: “apart from...occupational training,” meaning non-professional and discouraging pre-professional; “the civilizing of...life purposes,” implying emphasis on culture and on life beyond earning one’s daily bread; and “according to the best knowledge of our time,” suggesting the possibility of periodic change.

A slightly different viewpoint

HARVARD PORTRAIT



Emmanuel Akyeampong

WHEN PROFESSOR OF HISTORY and of African-American studies Emmanuel Akyeampong married his wife, Ruth, in 1995, the couple observed some nuptial customs in their native Ghana before the Episcopal service in Cambridge. In Accra, their two families sat opposite each other and exchanged gifts, including a Bible, six pieces of cloth, a stool, a mat, a bottle of gin, and two bottles of schnapps—this last a legacy of early Dutch settlers. Such rituals befit Akyeampong (ATCH-em-pong), probably the first social historian from Ghana. “Social history endeavors to look at history from beneath,” he says. “It studies those who do not have center stage—the poor, women, slaves, the unempowered.” It also imposes methodological challenges, because “these commoners are often poor and semi-literate,” he explains. “They do not keep records and diaries. Often, when they intrude into history, it’s because they caused some sort of commotion, like a riot, that the state recognized and recorded.” *Drink, Power, and Cultural Change: A Social History of Alcohol in Ghana, c. 1800 to Recent Times* (1996) reflects Akyeampong’s interest in mental health, considers alcohol as an instrument of power, and “looks at history through a glass,” he says, smiling. He came to Harvard in 1993 after earning his Ph.D. at the University of Virginia. A fellow of the Royal Historical Society, Akyeampong speaks the West African languages Twi and Ga. He enjoys squash, jazz, and classical music, as well as life with Ruth and their young son, Emmanuel. When they return home each summer, his college professors from the University of Ghana quiz Akyeampong about his recent writings: “I still have my oral exams,” he says.

comes from John Buchan [speaking at Commencement in 1938]...:

We live in a distressed and chaotic world whose future no man can predict, a world where the foundations seem to be cracking and where that compromise which we have christened civilization is in grave peril. What must be the attitude of those like ourselves in this critical time, those who have behind them a liberal education? For if that education gives us no guidance in such a crisis it cannot be much of a thing at all.

Buchan suggested that a liberal education should endow recipients with three qualities: humility, humanity, and humor. Humility, because "if we are educated men, with the treasures of the world's thought behind us, we shall not be inclined to overvalue ourselves or to claim too much for the work of our hands." For him, humility obviously presupposed knowledge. Humanity, because "We need a deepened respect for human nature. There can be no such respect in those who would obliterate the personality and make beings mere featureless details in the monstrous mechanism of the

state." This was 1938. He was undoubtedly thinking of Hitler and Stalin. Lastly, humor: "In a time like the present, when the ties of religion have been sadly relaxed, there is a tendency for popular leaders to exalt themselves in a kind of bogus deity and to think their shallow creeds a divine revelation. The answer to all that sort of folly is laughter." I do not know what was on Buchan's mind, but in the 1980s these thoughts strike uncomfortably close to home.

It bears noting that even as he wrote in 1990, when the Core model of general education was still gathering strength, Rosovsky thought it "reasonable to expect major curricular changes every 25 years or so."

"Connectivity"

What might be the basis for a contemporary general education—the subjects to be covered in the curriculum review's proposed "Harvard College Courses"—and how should students encounter the material? Saltonstall professor of history Charles S. Maier '60, Ph.D. '67, draws on his own undergraduate experience, and subsequent decades of teaching and scholarship, to advance some suggestions.

EVERY PROFESSOR probably starts by being a crypto-canonist. We may laugh at the lists of the indispensable cultural hits periodically promulgated by Mortimer Adler wannabes: the *acquis communautaire* of the chattering classes. Dare I confess that my parents had a set of The Harvard Classics? Nonetheless, in the words of the new planning document for curricular reform, we still think that our students should be acquiring some shared foundational knowledge. But what should it be? And how should they learn it, or we try to teach it? We aspire to structure but remain uncertain about content.

It seemed easier after 1945: the United States had defeated fascism, it had to oppose Soviet communism. There was a "West" that was liberal and democratic opposed to dangerous powers that were "totalitarian." The common basis of knowledge had to be the background and application of the values we believed in, and General Education was implicitly organized to teach our values, their history, their embeddedness in social systems, their literary expression. The social sciences, with their promise of rational analysis of the common life, and the natural sciences, the great project of modernity, fit in as well. The trend toward secularism, economic development, and modernization was clear.

These assumptions eroded in the 1960s under the impact of renewed ideological clashes: disillusionment with the Vietnam war and the concern that education was becoming too ransomed to producing the administrative class. Students resented the mass lecture, professors wearied of the interdisciplinary and nonprofessional approaches. What Henry Rosovsky and others designed to replace Gen Ed was no longer an effort to teach values—which were in chaos in any case—but methods. Knowledge was professionalized scholarship; there were no common values: ergo, teach how the different branches of learning pursued their insights. We traded in hubris for methodology. Of course, this is too simple: many of the courses could be offered under both pedagogical regimes. "Good and evil" in General Education became "moral reasoning" in the Core; the historical records of the great civilizations

Compensation Flap Continued

Further news coverage of the compensation of Harvard Management Company's (HMC) highest-performing portfolio managers, who earned up to \$35.1 million in the 2003 fiscal year (see "'Extraordinary' Bonuses," March-April, page 69), prompted further comment from the University. On June 4, the *New York Times* ran a front-page story on alumni criticism of the pay formula. Two days before his previously announced retirement on June 30, Harvard Treasurer D. Ronald Daniel responded in a letter disseminated along with the alumni association's electronic "Harvard Monthly" newsletter. Daniel's comments went beyond those he made in January, when the compensation figures were released. In the new letter (available electronically at www.aad.harvard.edu/devel/images/hmc_compensation.pdf), he reviewed the rationale for Harvard's in-house system of managing the endowment through HMC; indicated why HMC's compensation appears higher than that at other institutions who retain external investment professionals; and reported that, compared to the results of the two highest-paid HMC managers, "Had equivalent performance in these portfolios been achieved through external hedge fund management, we estimate that Harvard would have paid roughly four times in fees what it paid...in salary and bonuses." Despite the "extraordinarily high bonuses" occasionally resulting from extraordinary investment returns, Daniel wrote, the HMC board remains focused on "how to generate the best investment returns for Harvard net of costs, not simply to reduce costs at whatever risk to the capacity to generate excellent returns." Investment results for the year ended June 30, which determine bonus payments for fiscal year 2004, will be released in mid September.

were taught under both; the sciences could make their way in both. And no doubt this continuity will continue.

Still, it is time to change the framework. All educational approaches flag after 20 years: Jefferson may have been glib about revolutions in government, but he would have a case about teaching. Faculties re-energize themselves with a periodic thrashing out of the curriculum. How should we change?

The issue is not just one of small classes versus the large lecture. Students want,

and the administration rightly seeks to provide, milieus for learning that allow students actively to exchange ideas with full faculty members as well as aspiring younger ones. But the large lecture has always played a major curricular role and the economics of the faculty-student ratio ensures that it will still have to: there simply can't be enough of us to convert the undergraduate curriculum to a series of seminars. Moreover, professors bring different gifts: some can teach memorably through probing Q and A and offer comradeship in

genuinely common inquiry; others can convey sovereign mastery—the drama of 1789 or 1989, the elegance of Maxwell's equations—through the lecture. The courses that my classmates remember 40 years out are usually those that featured brilliant lecturers. The good lecture is not just a passive instilling of fact, but an invitation to take part in learning. It can be developed by selecting students to participate (which wakes up the whole hall) in the search for the decisive insight into, say, a poem's "work," or the causes of a war, or

Yesterday's News

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

1914 When an alumnus threatens to cut a \$10-million bequest to Harvard out of his will unless outspokenly pro-German professor Hugo Münsterberg is fired, the University replies that it "cannot tolerate any suggestion that it would...accept money to abridge free speech, to remove a professor, or to accept his resignation."

1929 The editors warn: "Princeton will not allow its undergraduates to keep them. Stevens, head coach at Yale, has forbidden his football squad to ride in them during the season....If undergraduates are less in their rooms today, and consequently less accessible to the knowledge of one another and of books; if they are more in the company of girls, more addicted to dancing and visiting, thanks are largely due to the automobile."

1934 For the first time, the *Crimson's* pamphlet of "confidential" advice on College courses is sent to first-year students before they arrive at Harvard.

1944 The Board of Overseers votes in favor of admitting women to Harvard Medical School, effective with the class entering in the fall of 1945.

1949 The football team flies 3,000

miles on United Airlines' "Harvard Football Special" to play Stanford, loses 44-0, but wows California reporters (one column is headlined "Harvard Players Just Like People").

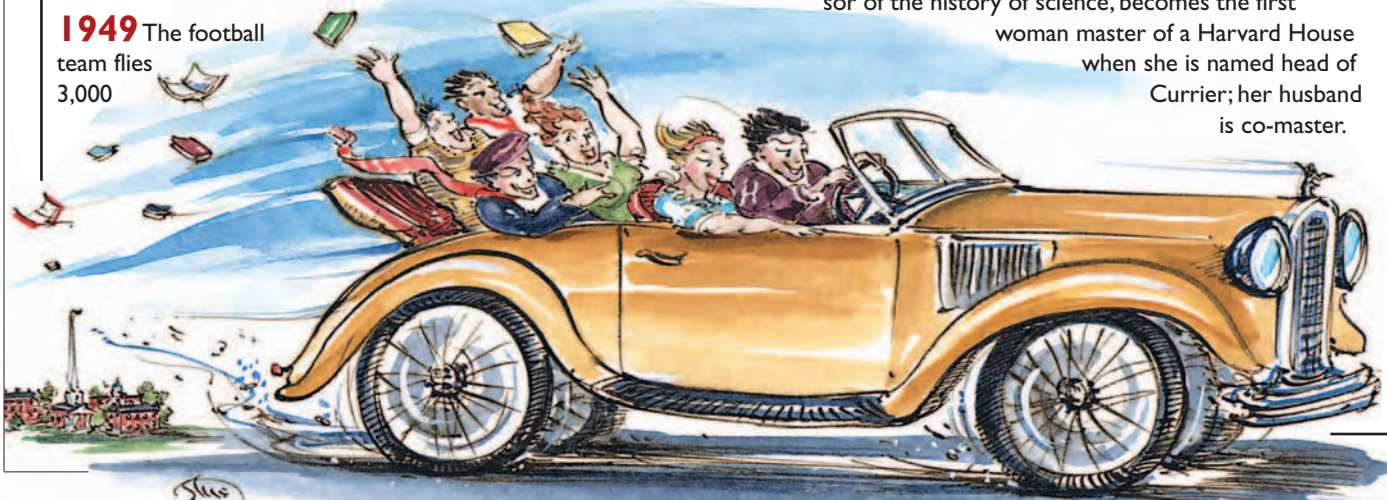
1954 Although a few Houses still hire maids to clean undergraduate rooms on weekdays, "gracious living" no longer means having your bed made; the College, which cut Saturday bed-making in 1951, has ended the service completely.

1959 Astronomy professor Donald H. Menzel and his freshman seminar students board a Northeast Airlines DC-6 to observe the first solar eclipse visible from New England in 300 years. Due to cloud cover, no one else in Boston sees anything.

1964 A survey of just-graduated seniors reveals 16 percent of those seeking full-time jobs have volunteered for the Peace Corps; only engineering, research, and technical jobs rank higher.

1969 Eighty grams of moon rocks scooped up by Neil Armstrong arrive at Harvard for analysis.

1974 Barbara Gutmann Rosenkrantz '44, associate professor of the history of science, becomes the first woman master of a Harvard House when she is named head of Currier; her husband is co-master.





1971

the complexity of a natural process.

The real question for renewal of a small-“c” core is what unifying idea will replace that of *values* (which underlay Gen Ed) or *methods* (which was implicit in the big-“c” Core). Designation of certain classes as Harvard College Courses does not suffice: this is a concept which, like *premier cru*, may suggest quality but not substance. Gen Ed and the Core attracted wider notice because they identified a pedagogical agenda as timely and significant. The problem is made more challenging because these courses cannot rely merely on interdisciplinarity, although many should be interdisciplinary. But all our departments and disciplines are in flux and oozing out of their boundaries. And so, too, are the traditional larger areas of humanities, social sciences, and natural sciences. The new core should not be frozen within even these larger categories, which increasingly fail to structure the most challenging advances of knowledge.

My belief is that the conceptual basis of the new core must consist of a commitment to *connectivity*—in part for all the reasons that bombard us every day as virtual clichés. The first is *globalization*: the need to deal with a world community and the



1980

deprivileging of Western values (or from another perspective, their world-wide diffusion). Second is the new *episteme*—i.e., the common underlying cognitive metaphor—of the *network*, whether in com-

merce or computers. Third is the moral or ethical challenge that confronts a highly privileged nation and a vastly privileged university at the beginning of the twenty-first century: neither to vaunt the West's cultural legacy, nor yield to a fascination with our own scholarly skills, but rather to help construct a more decent and rights-oriented and a less unequal global community. At the core must be a sense of connectivity—as a moral premise, as a guiding thread to understanding cultures, as a stimulus for scientific knowledge—to be researched and studied, and to be constructed.

Humanities Education

Porter University Professor Helen Vendler, Ph.D. '60, chosen to present this year's Jefferson Lecture in the Humanities in May, used the occasion to argue that the arts and “aesthetic endeavor,” rather than history or philosophy, should be made central to the

study of humanities. A renowned scholar of poetry, Vendler illustrated her argument by analyzing three works of Wallace Stevens. The excerpts presented here are shorn of those examples and her explications, in the interest of focusing on passages in Vendler's text that bear most directly on issues of curriculum and the purposes of a liberal arts education. The complete lecture is available on the National Endowment for the Humanities website (www.neh.gov/whoweare/vendler/index.html).

I WANT TO PROPOSE that the humanities should take, as their central objects of study, not the texts of historians or philosophers, but the products of aesthetic endeavor: architecture, art, dance, music, literature, theater, and so on. After all, it is

by their arts that cultures are principally remembered. For every person who has read a Platonic dialogue, there are probably 10 who have seen a Greek marble in a museum, or if not a Greek marble, at least a Roman copy, or if not a Roman copy, at least a photograph. Around the arts there exist, in orbit, the commentaries on art produced by scholars: musicology and music criticism, art history and art criticism, literary and linguistic studies. At the periphery we might set the other humanistic disciplines—philosophy, history, the study of religion. The arts would justify a broad philosophical interest in ontology, phenomenology, and ethics; they would bring in their train a richer history than one which, in its treatment of mass phenomena, can lose sight of individual human uniqueness—the quality most prized in artists, and most salient, and most valued, in the arts.

What would be the advantage of centering humanistic study on the arts? The arts present the whole uncensored human person—in emotional, physical, and intellectual being, and in single and collective form—as no other branch of human accomplishment does. In the arts we see both the nature of human predicaments—in Job, in Lear, in Isabel Archer—and the evolution of representation over long spans of time (as the taste for the Gothic replaces the taste for the Romanesque, as the composition of opera replaces the composition of plainchant). The arts bring

into play historical and philosophical questions without implying the prevalence of a single system or of universal solutions. Artworks embody the individuality that fades into insignificance in the massive canvas of history and is suppressed in philosophy by the desire for impersonal assertion. The arts are true to the way we are and were, to the way we actually live and have lived—as singular persons swept by drives and affections, not as collective entities or sociological paradigms. The case histories developed within the arts are in part idiosyncratic, but in part applicable by analogy to a class larger than the individual entities they depict. Hamlet is a very specific figure—a Danish prince who has been to school in Germany—but when Prufrock says, “I am not Prince Hamlet,” he is in a way testifying to the fact that Hamlet means something to every one who knows about the play.

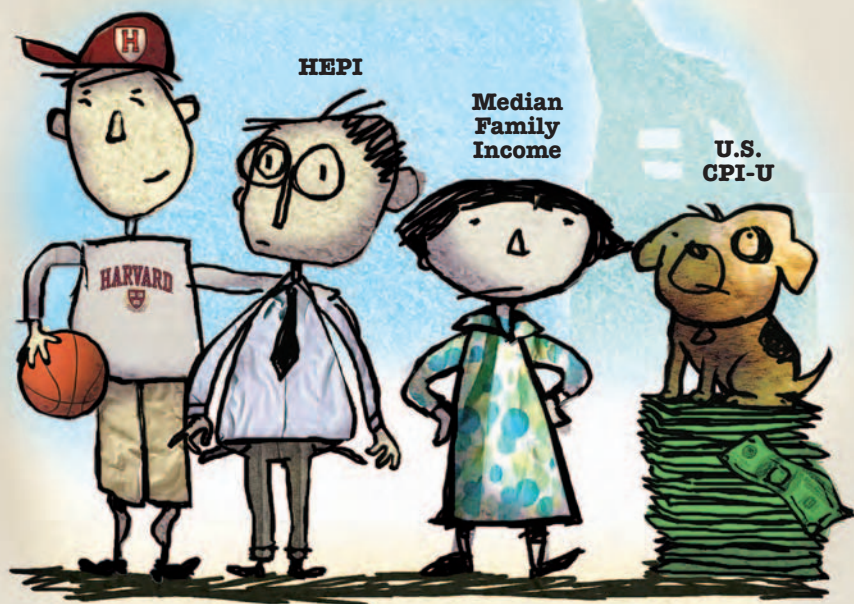
...Our culture cannot afford to neglect the thirst of human beings for the representations of life offered by the arts, the hunger of human beings for commentary on those arts as they appear on the cultural stage. The training in subtlety of response (which used to be accomplished in large part by religion and the arts) cannot be responsibly left to commercial movies and television. Within education, scientific training, which necessarily brackets emotion, needs to be complemented by the direct mediation—through the arts and their interpretations—of feeling, vicarious experience, and interpersonal imagination.... Students can be gently led, by teachers and books, from passive reception to active reflection. The arts are too profound and far-reaching to be left out of our children’s patrimony: the arts have a right, within our schools, to be as serious an object of study as molecular biology or mathematics. Like other complex products of the mind, they ask for reiterated exposure, sympathetic exposition, and sustained attention.

The arts have the advantage, once presented, of making people curious not only about aesthetic matters, but also about history, philosophy, and other cultures. How is it that pre-Columbian statues look so different from Roman ones? Why do some painters concentrate on portraits,

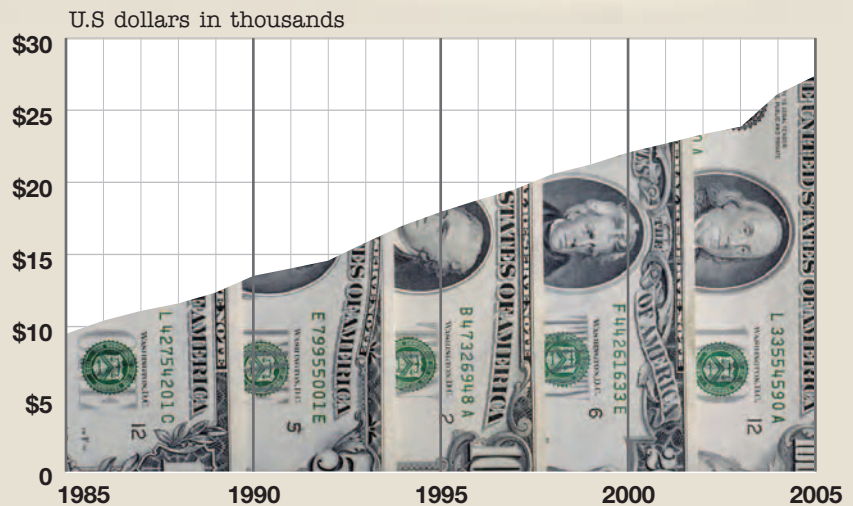
HARVARD BY THE NUMBERS

During the past 20 years, Harvard’s undergraduate bill has risen from \$14,000 to \$39,880 per academic year (before any offsetting financial aid), an increase of 183 percent. The figures below compare tuition and fee growth to the higher-education price index (up about 110 percent); median family income (roughly doubled); and the urban consumer price index (up about 80 percent). Tuition exclusive of room, board, and fees—graphed at bottom—rose from \$9,500 to \$27,448.

Tuition and Fees



Undergraduate Tuition, FY 1985-FY 2005



Source: Harvard University Fact Book

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others on landscapes? Why did great ages of drama arise in England and Spain and then collapse? Who first found a place for jazz in classical music, and why?... Why have we needed to invent so many subsets within each art—within literature, the epic, drama, lyric, novel, dialogue, essay; within music, everything from the solo partita to the chorales of Bach?...Who has the right to be an artist?...The questions

accomplishments in progressive abstraction—in mathematics and the natural sciences—with an equally great absorption in art, and in the disciplines ancillary to art. The arts, though not progressive, aim to be eternal, and sometimes are. And why should the United States not have as much eternity as any other nation? As Marianne Moore said of excellence, “It has never been confined to one locality.”



2003

Education in the Sciences

From the outset, the curriculum review has emphasized the importance of “an education in—not just an introduction to—the physical, applied, and life sciences” as a central part of “the general education we expect of all students” in the present scientific and technological era. So wrote Dean Kirby in his letter transmitting the curricular review report to the faculty last April.

The challenge lies in discovering how to do so effectively. Many students who indicate an interest in science are turned off by introductory courses. Many others, pursuing different disciplines, avoid the courses designed for concentrators and find “science for nonscientists” classes patronizing. Kirby in May announced a faculty committee charged with addressing the problem.

Mallinckrodt professor of physics Howard Georgi '68, If '76—the department's director of undergraduate studies, and master of Leverett House—has twice been recognized by the Undergraduate Council for superb teaching. The magazine asked him to comment on science in the contemporary classroom. His response, focusing on concentrators, may suggest more generally applicable themes.



2003

are endless, and the answers provocative; and both questions and answers require, and indeed generate, sensuous responsiveness, a trained eye, fine discrimination, and a hunger for learning, all qualities we would like to see in ourselves and in our children.

...Just as art is only half itself without us—its audience, its analysts, its scholars—so we are only half ourselves without it. When, in this country, we become fully ourselves, we will have balanced our great

TEACHING NATURAL SCIENCE at Harvard to concentrators and prospective concentrators is a wonderful experience. Many of the students are brilliant, motivated, articulate, interactive, and sometimes even grateful for our efforts. Many of us who spend a lot of time teaching these fantastic students realize how lucky we are to have the opportunity.

But even under these ideal working conditions, or perhaps because of them, it is very easy to fall into the trap of teaching primarily to the handful of students with

whom we communicate best. Slowly, over many years of teaching, I have learned how to avoid this pitfall and to engage more and different students. What works here is not rocket science, or any kind of science for that matter. The most important part of the process is human interaction. The teacher must get to know and care about the students as individuals and the students should get to know and trust the teacher and get to know and work with their fellow students. What one wants to foster is a kind of all-in-the-same-boat atmosphere. Ultimately the students have to do the learning themselves. That requires a lot of hard work, but a good relationship with the teacher can do a lot to motivate them to work hard enough to learn.

This kind of teaching has very little to do with lecturing. Lectures in the natural sciences can be entertaining and fun. They can encourage the kind of atmosphere that leads to effective learning. But almost all of the real learning goes on elsewhere, where the students are struggling with intellectually challenging problems. A little of that struggle can go on in the lecture hall if the teacher uses techniques to make the class more interactive, asking frequent questions and pausing to encourage discussion among students. Two of the large lecture rooms in the Science Center are fitted out with a system in which the students can answer questions in real time by pressing buttons on hand-held remote units. The teacher (and the class) can ask a question and, one minute later, project a histogram of the responses on a screen for all to see. This can also be used to encourage the students to interact with and teach one another. The students love it. This is not technology for its own sake. Like the technical effort that goes into course Web pages, it is specifically designed to encourage human interactions.

I do not believe that there are any one-size-fits-all techniques for effective science teaching. Instead, we should always be working at several different schemes at the same time, because it is important to accommodate as many different learning styles as possible. But the common thread in the schemes that I find most effective is group learning and teaching—students working in groups, discussing problems

with one another, in frequent contact with a faculty member or teaching assistant (TA). In my freshman and sophomore courses, this goes on in my office a couple of afternoons a week and, on a much larger scale, in the Leverett House dining hall from about 9 P.M. until the wee hours of the morning on the Wednesday night before a problem set is due.

In these venues, I get to see how the students think about problems and how they interact with each other. This is where I get to know them and they me. The Physics Nights at Leverett now attract study groups from



many different physics courses, and a number of faculty members and TAs take part as well. It is quite exhilarating (if occasionally exhausting). The sessions in my office are much more intimate, usually involving from a handful to a dozen students, often with a particular concentration of students who approach the material in unusual ways.

Perhaps the most important and surprising thing I have learned is that there are always a number of students who are tremendously talented and who understand the material very well, but who do very poorly on timed exams. There are many different reasons for this. Sometimes it is simple panic. But often it is related to the kind of idiosyncrasy of thought that we should be encouraging, rather than stifling. In part because of this, I try to avoid even the appearance of competition for grades. And I continue to try to find testing strategies that will reward real understanding rather than just the ability to perform well under pressure. The students are worth the effort.

“Roots” and Race

IN JUNE, a *New York Times* article raised a long-simmering issue: the origins and ancestry of Harvard’s black students. The piece described the celebratory mood at a reunion of African-American Harvard alumni, who applauded Harvard’s progress over the past three decades in enrolling larger numbers of black students. But it also noted that this mood was broken when “some speakers brought up the thorny issue of exactly who those black students are.” The question arises because, even though in recent years 7 to 9 percent of Harvard’s incoming freshmen (8.9 percent for the class of 2008) have been African Americans, some studies suggest that more than half of these students, and perhaps as many as two-thirds, are West Indian or African immigrants or their children. A substantial number also identify themselves as children of biracial couples.

The figures are inexact partly because they are unofficial; there are no official data, because the Harvard admissions office does not collect information on the ancestry of incoming freshmen. But a handful of scholars have explored the question, which remains a lively one. “I’ve been teaching courses

in race and ethnicity here for 18 years, and almost every time I teach a class, this issue comes up,” says professor of sociology Mary Waters. “It is very commonly discussed among black students at Harvard.” Four years ago, Waters advised an honors thesis—which she calls “the best study I know of on the topic”—by one

such student, Aisha Haynie ’00, an African American whose family has long resided in the southern United States. Her research, published in the *Journal of Public and International Affairs* in 2002, tried to ascertain the provenance of Harvard’s black undergraduates.

Haynie went through copies of the Harvard *Freshman Register* and, based on the photographs therein, contacted fellow students who looked black. She also located subjects through Harvard’s black student organizations and black undergraduate listservs. Her sample, though not random, was large enough to yield at least some data on nearly a quarter of black undergraduates, by her estimate. Using questionnaires and interviews, Haynie found that, while a clear majority identified themselves as “black American,” African and Afro-Caribbean identifiers combined made up more than a third of the subjects, and her “bi-ethnic or bi-racial” category accounted for about a quarter (see table).

Turning to ancestry, Haynie found that although first-generation (immigrants born outside the United States) black Americans showed up in her study in numbers proportionate to the U.S. Census, second-generation (born in the United States, with at least one parent born overseas) blacks made up 41 percent of her Harvard pool—but only about 3 percent of black Americans (see page 70). Fourth- (and higher) generation African Americans, who represent nearly 90 percent of the American black population, accounted for only 45 percent of the black students she studied. In pursuing her research, Haynie re-

calls meeting resistance from Harvard deans and admissions officials. “They were saying, ‘You shouldn’t be trying to divide students along ethnic lines,’” she says. “But they’re already divided! Just look at the data.”

African Americans, who account for 13 percent of the U.S. population, are statistically under-

represented at Harvard and other selective colleges. Black students descended from multiple generations of American forebears may be underrepresented to an even greater degree. Within the United States, there are also regional differences: West Indian and African immigrants, for example, have

Ethnic Self-Identification among Harvard Black Students*

Black American	57.1%
Afro-Caribbean	21.2%
African	13.6%
Bi-ethnic or biracial	25.9%

*Number=170; percentages total more than 100 because subjects could choose more than one self-identification.

Source: Haynie article in *Journal of Public and International Affairs*, 2002