FACULTY GROWTH AND RENEWAL

Dean's Letter on Growth and Renewal of the Faculty

Harvard University
Faculty of Arts and Sciences

APRIL 2007

HARVARD UNIVERSITY
Faculty of Arts and Sciences

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Dear Colleagues:

My first letter, in October, focused on the financial situation and prospects of the Faculty. In that letter, I noted several factors contributing to the considerable rise in our expenditures. The largest of these is the splendid—if almost unprecedented—investment in increasing the number of faculty colleagues. To be sure, we have also made substantial commitments to undergraduate financial aid and graduate fellowships, and we have allocated new funds to the development of the curriculum and to the improvement of student life. But the primary investment has been in the number of ladder faculty members[1] in the Faculty of Arts and Sciences, and the concomitant support of our new colleagues with offices and laboratories, teaching facilities, library resources, equipment, and all the necessary administrative underpinnings.

In this letter, I discuss the continuing growth and renewal of the Faculty, mindful of the financial constraints that we are likely to face in the coming few years about which I wrote last time. I want first to report on recent *faculty growth and renewal*, second to outline our expectations for *further targeted expansion*, and third to think about *what we hope to achieve*. As with the earlier letter, I hope to establish a common awareness of these matters, so that we can—with my successor and President Faust—approach the decisions already made, and those ahead, with a shared understanding of what drives them.

[1] That is, assistant, associate, and full professors.

I. Growth and renewal

The title of this letter includes both the words "growth" and "renewal," to signal how we should think about adding colleagues to the Faculty. In my view, *growth* must indicate (and achieve) something more than just an increase in size, and *renewal* must mean (and accomplish) something more than merely maintaining our numbers. No particular distribution of colleagues across the intellectual landscape is perfect, and as we increase and renew our ranks we must not be slavishly bound by the distribution that we have inherited. Each time we have the opportunity to appoint a new faculty member, whether the opening derives from the departure of a colleague or the creation of an incremental position, we (first within the department, and then with the Divisional Dean) must rethink—in today's terms—how best intellectually to enrich the Faculty. We have a dual responsibility, to educate our students for the challenges and opportunities of the new century, and to achieve a deeper range of scholarly excellence.

While it is natural for us to think about the exciting potential of growth, changes in the shape of the Faculty derive much more from renewal than from growth. Thus—even in the past nine years during which we have added, remarkably, a net of 108 new colleagues—the number of new appointments made simply to *maintain* the steady-state size of the Faculty was 279. This is vividly illustrated in Figure 1, which simply emphasizes how critical it is that we scrutinize the field and sub-field of each appointment that we make, the large majority of which will come from turnover, rather than from incremental growth.

The additions that we have made to faculty numbers in different divisions and departments have not been evenly distributed, and we must ask what determines these allocations. Amongst the criteria that affect differential growth across the Faculty are: raw teaching need, the intellectual balance across the Faculty, and new areas of scholarship. In terms of teaching need, we must obviously be responsive to the pressures

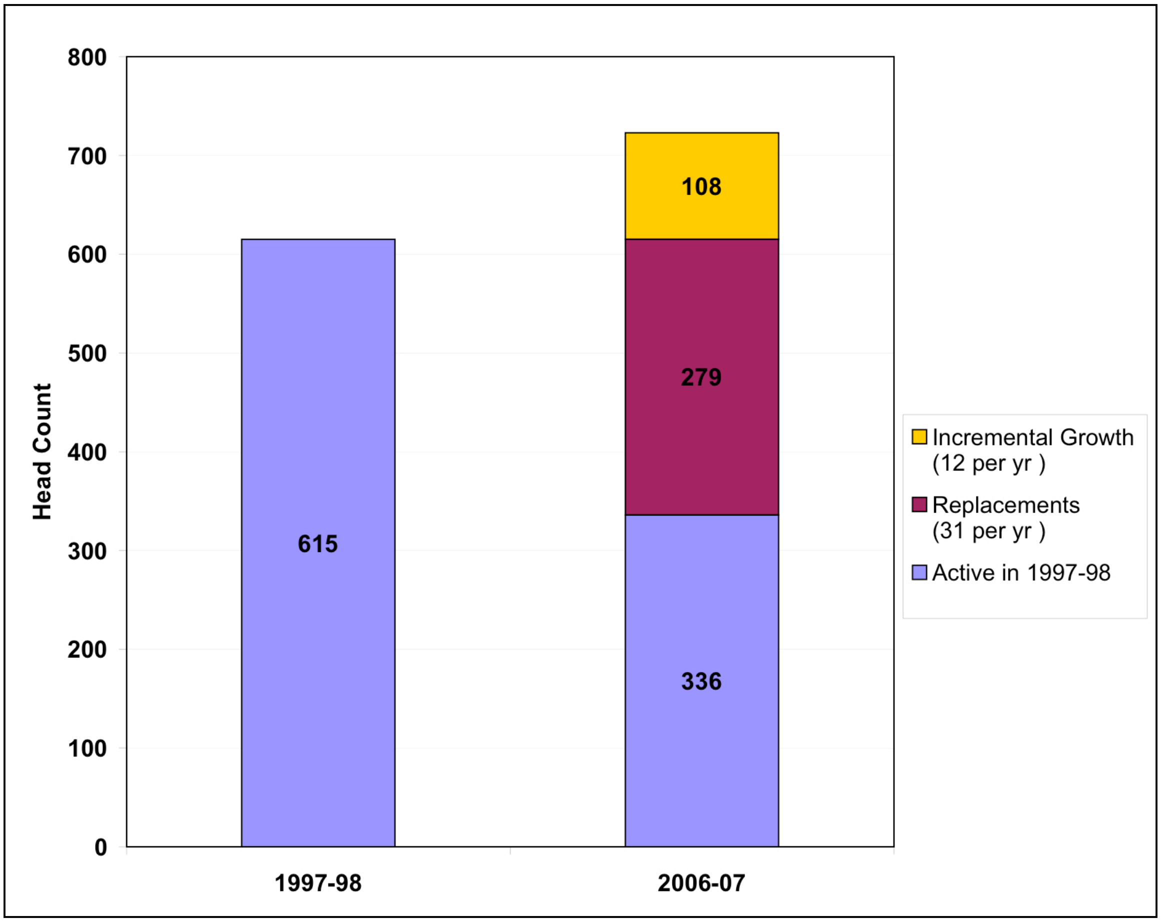

Figure 1. Growth and renewal of ladder faculty between 1998 and 2007[2]

of student enrollment,[3] if only to ensure that some groups of colleagues are not much more taxed than others, and that the quality of our offerings (advising, tutorial, thesis supervision, courses in general education, faculty-student connectivity, and the rest) is not compromised by inadequate faculty strength. Yet that is not the only criterion, for even if the hiring of new faculty could be nimble enough to respond to changing student

[2] In each of these years, 1998 and 2007, the percentage of tenured colleagues was the same, at 69%.

[3] In the case of the lecturers, preceptors, and drill instructors who support our programs in language and math, for example, student enrollment is the dominant metric. The distribution of these appointments properly and necessarily reflects enrollment pressures, consistent only with the maintenance (often collaborating, as we do, with neighboring institutions) of the *range* of our curricular offerings.

interests, we are a Faculty, not a factory. Even if (let us say) there was hardly any student interest in physics or philosophy, it would be quite improper not to have the best Physics and Philosophy departments that we can build. Intellectual life in the FAS would be unacceptably impoverished if it did not include physicists and philosophers populating the Faculty's landscape. Moreover, our efforts at curricular renewal, particularly those associated with developing a new program in General Education,[4] should lead us to think more broadly about the subject areas in which we teach, and perhaps even about the way in which our disciplines are arranged into departments. There is no simple metric or formula that determines the optimal shape of the FAS.

Our decisions about faculty hiring are also influenced by new areas of scholarship and by newly emerging frontiers of research. This is especially true in the sciences, where such opportunities emerge continually. We shall not be, and certainly not perceived to be, a Faculty of the first rank if we fail to seize upon the excitements of research and teaching in areas such as genomics, nanotechnology, neurobiology, or information science.

We shall therefore see in what follows that we must concentrate much of the near-term *incremental* growth in the sciences, while ensuring that the much larger number of opportunities for faculty appointments that arise simply from maintaining our present size, are carefully directed so as to enrich and enliven the intellectual atmosphere that all of us came here to be a part of, and to enjoy.

II. Faculty growth in the last decade: the first and second waves

For as long as I can remember, our colleagues have felt that this Faculty is relatively small, one whose members both carry more responsibility for a demanding student body, and bear higher expectations for scholarly excellence and productivity, than those who work in larger departments elsewhere. At the disciplinary and sub-disciplinary

[4] See *Report of the Task Force on General Education*, February 2007.

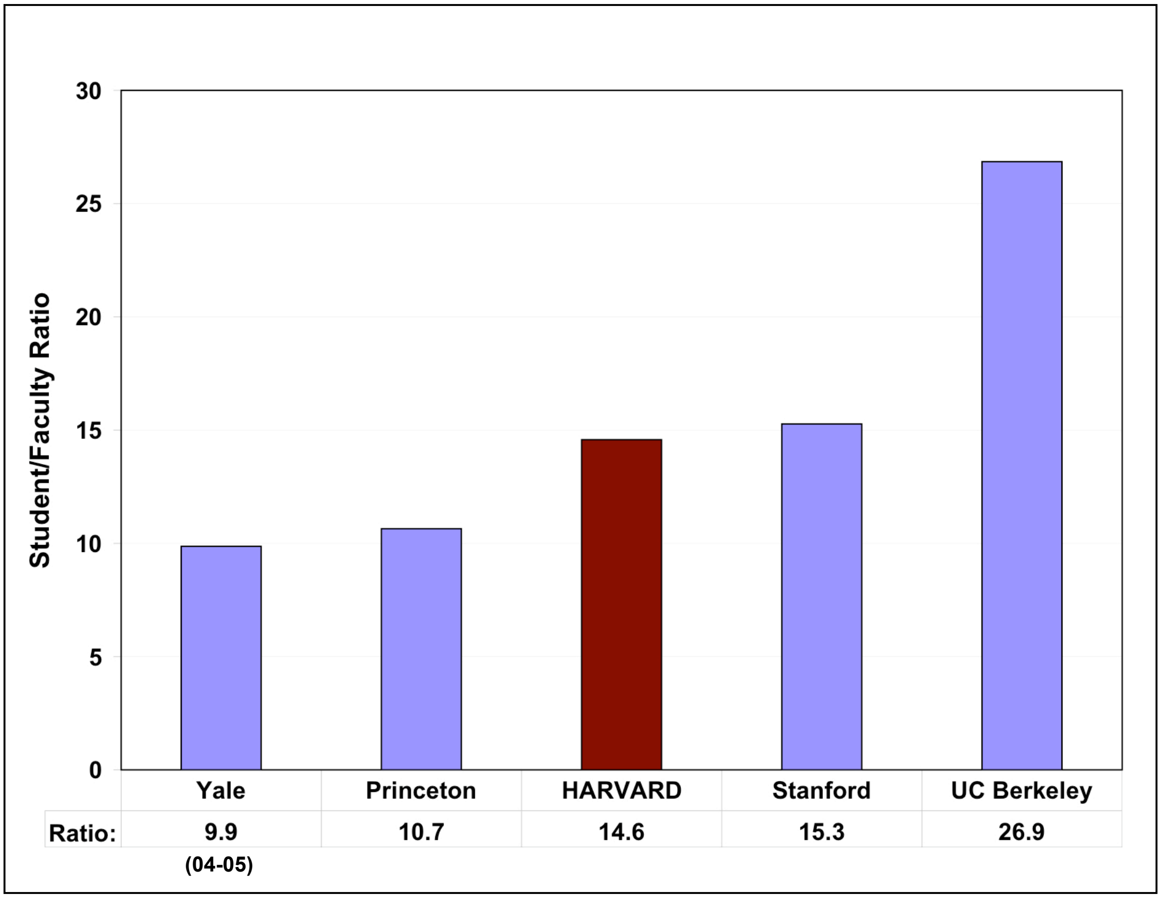

Figure 2. Student:ladder faculty ratios in several institutions, 2005-2006

level, this is often true. Even as a whole, the FAS has historically had relatively fewer members (see Figure 2), taught relatively larger classes, and been more pressed to give the individual attention to undergraduates and graduate students from which both the students and the faculty profit. I should note that our plans have always been predicated on the expectation that the number of undergraduates admitted to the College would not increase before about 2015, in any case.

Recognizing these facts, the decision to increase the size of the Faculty was part of the academic plan for the FAS that was developed in 1991-92. Raising funds to endow new professorships was a central goal of the Campaign that began soon thereafter.

Until these new funds began to flow, however, the size of the Faculty necessarily remained pretty constant.[5]

The first steps to add *incrementally* to the Faculty began in 1999 as the fruits of the Campaign ripened, when we established a goal (in retrospect, rather a modest one) of adding six net new members to the Faculty every year for a decade. In fact, as noted above, our numbers have grown much more rapidly than that, from a total of 615 ladder faculty in 1999, to 723 today—an increase of over a hundred new colleagues in nine years. *This is a larger increase than in the four preceding decades combined*.[6] Figure 3 charts the progression of this growth.

Simultaneously, of course, new colleagues have succeeded those who have departed.[7] These new colleagues have maintained our existing strengths, and, along with the incremental positions, have created new areas of disciplinary excellence (such as brain science, film and media studies, cognitive psychology, the environment, and computer science).

When we first began to increase the size of the Faculty in the late 1990s, we were perhaps overly focused on sheer size relative to our peer institutions, and on improving the student:faculty ratio. We knew that we lagged in these terms, and that a larger faculty could have a direct and positive impact on our students. We knew that graduating seniors had consistently remarked on the limited opportunities that they had had for interactions

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[5] Although there was a steady rise in the *proportion* of tenured faculty, which served slightly to ameliorate the "faculty-search exhaustion syndrome" that was endemic in the early 1990s.

[6] The last burst in ladder faculty numbers was in the early 1960s, and was accompanied by a concomitant building boom. Ladder faculty numbers grew from about 400 to over 600 in the 1960s. Between 1955 and 1975, the following buildings were added to the Faculty's stock: William James, Hoffman Laboratory, Coolidge Hall, the Engineering Science Laboratory, the Carpenter Center, 34 and 38 Kirkland, 5 Bryant, 38 and 42 Oxford, the Conant Laboratory, the Loeb Drama Center, the Observatory B Building, Pusey, Tozzer, the Science Center, Robinson, the MCZ laboratories, and Perkins, and—for the College—Quincy House, Pennypacker, Greenough, Hurlbut, Leverett towers, Mather House, Palmer Dixon, Hilles, and Canaday.

[7] The efflux from the Faculty by retirement is obviously relevant, and the fact that the FAS is proportionately rather "grayer" than many of our peer institutions is a concern, because of the consequences for new leadership, space, teaching involvement, intellectual renewal, and budgets. But this complicated subject needs a more nuanced discussion, at another time.

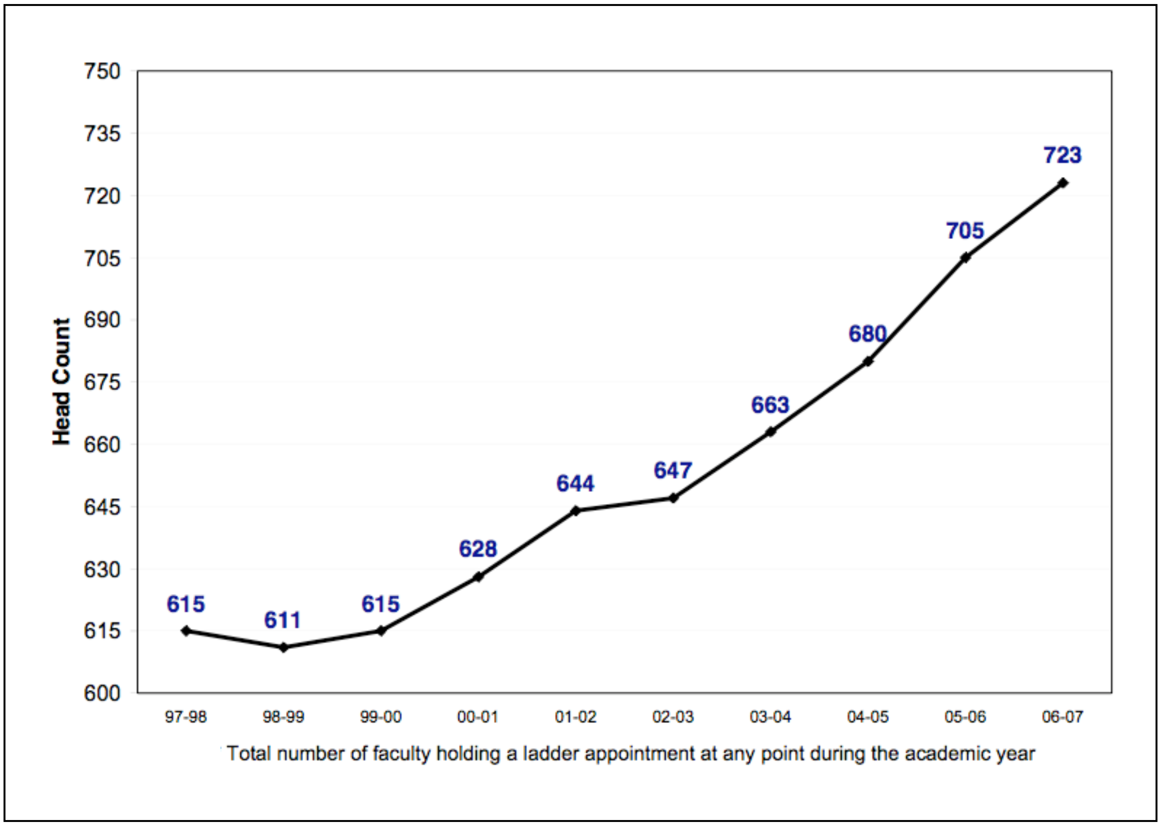

Figure 3: Total ladder faculty in the FAS, 1997-2007

with the faculty. We knew that a more generous (and more competitive) faculty leave policy would exacerbate rather than ameliorate this problem. And we knew that colleagues in some departments were too stretched, finding less time for the scholarly work that they had believed would better flourish when they came to Harvard. So the early allocation of incremental faculty was driven primarily by teaching need rather than by the academic or intellectual "balance" of the Faculty. Given that many of our largest enrollments and concentrations are in these two divisions, it is not surprising that the first two waves of faculty growth were mainly in the arts and humanities, and in the social sciences, respectively.

III. The present distribution of faculty

Acknowledging the recent growth illustrated in Figure 3, let us examine the overall distribution of faculty colleagues across the divisions, as illustrated in Figure 4,[8] and also how we compare with some of our peer institutions, illustrated in Figure 5.

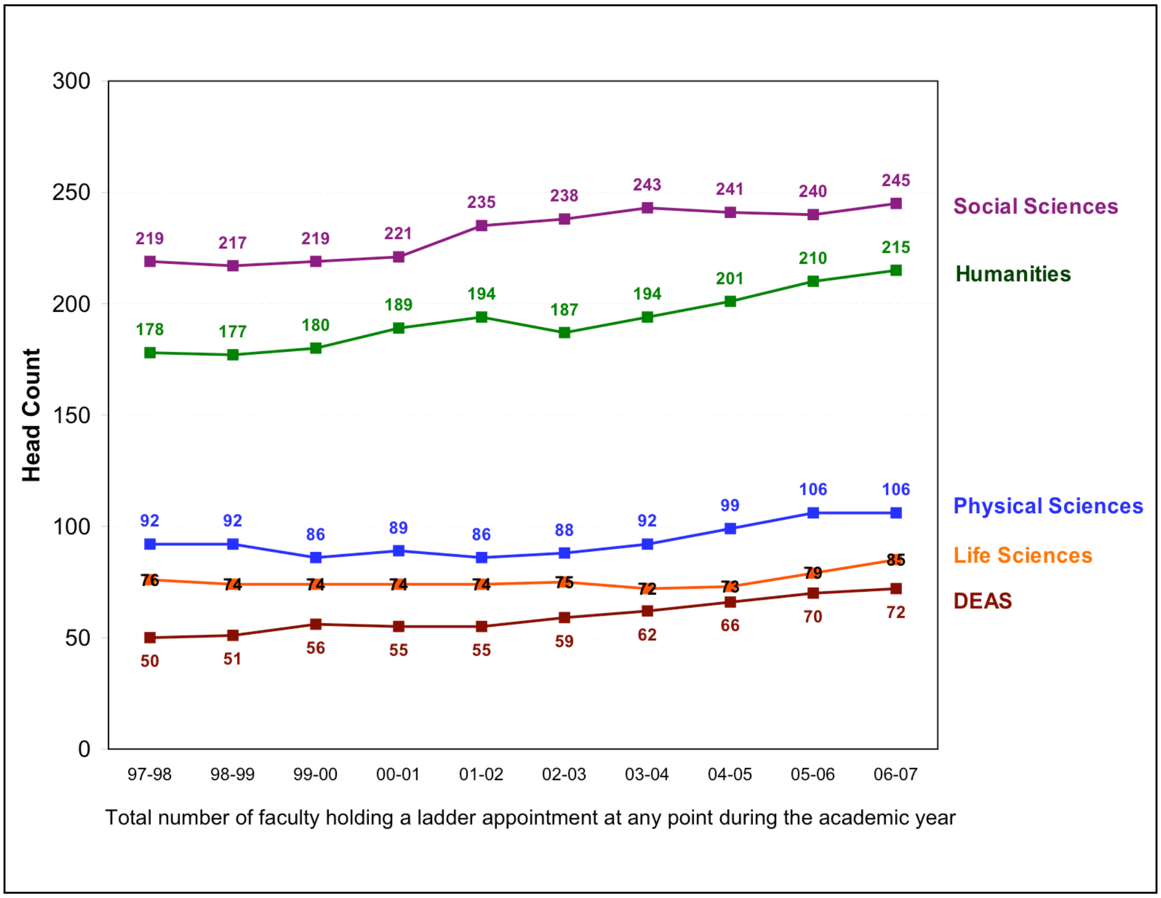

Figure 4. Total ladder faculty, by division, 1997-2007

From Figure 5, we see that the natural sciences now comprise 26% of FAS faculty, compared to 29% at Princeton and 30% at Stanford. Even Yale—a university

[8] In the decade preceding the one illustrated, the ladder faculty head-counts were really quite stable. Thus, between 1988 and 1997 the number of ladder faculty in the humanities fell by 1%, the number in the natural sciences fell by 3%, and the number in the social sciences rose by 8%.

that has long been known for its excellence in the arts and humanities—has a larger proportion of faculty in the natural sciences (29%). Thirty percent of the FAS faculty are in the humanities, 34% are in the social sciences, and 10% are in engineering and applied sciences.

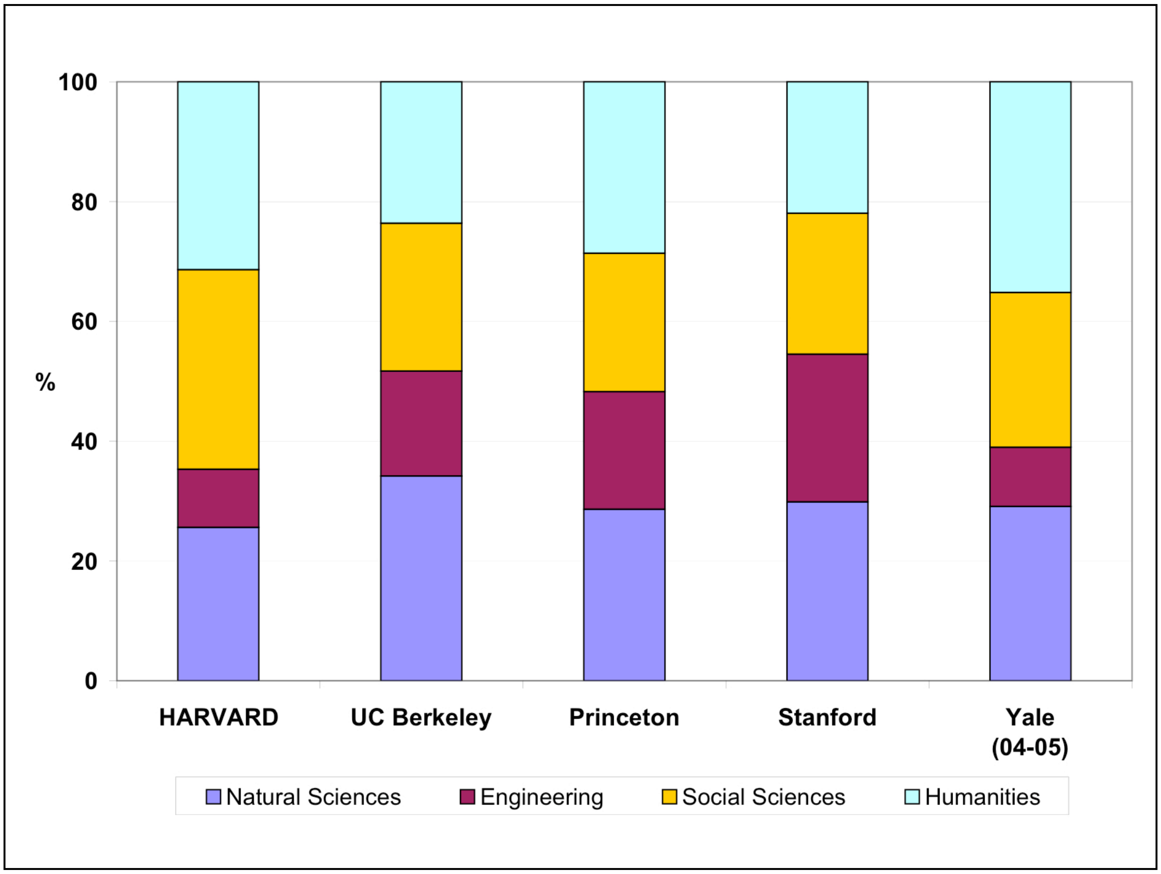

Figure 5. Distribution of ladder faculty across divisions in several institutions, 2005-2006

In presenting these data I do not mean to suggest that we should blithely or blindly follow trends elsewhere, or that we should shape this Faculty to fit some average norm. Nor am I saying that Harvard science has been anything but first-rate. There is plenty of evidence to support the Kellers' account of Harvard's recent past, when they wrote: "The sciences could make a fair case for being the jewel in the academic crown of late-twentieth-century Harvard."[9] This academic distinction notwithstanding, many people, both externally and internally (the Corporation, the Overseers, visiting committees, and beyond) have concluded that the FAS has systematically underinvested in science, even while maintaining an enviable niche position of excellence in many scientific areas.

IV. Growth and renewal in the next few years: the third wave

Let me return to the future. First, the demographics of our faculty lead us to expect that we shall continue to be able to make a large number of new appointments in *every* division of the Faculty. Just in the next three years, for example, *we face the need to appoint about 120 ladder faculty simply to maintain our present size*. This total is based upon the expectation of the following numbers of faculty departures: humanities, 39; social sciences, 43; life sciences, 14; physical sciences, 15; and School of Engineering and Applied Sciences (SEAS), 9. In making these appointments we must aim, of course, not simply to replace—subject-for-subject, or subdiscipline-for-subdiscipline—a retiring or departing colleague, but rather to seek new faculty who best enhance our current distribution and intellectual range. As I have emphasized above, the natural and inevitable turnover of the faculty provides a very much larger opportunity for making appointments in new fields than even the most ambitious program of incremental growth.

Having said that, one clear message from my last letter was that the pace of faculty growth must moderate to a level that we can financially sustain,[10] and that most of the *net* growth in the next few years (taking us from an estimated 732 in July of 2007, to perhaps a plateau of 750 by July 2010) will be in the sciences and engineering.[11] As a

[9] Morton Keller and Phyllis Keller, *Making Harvard Modern*, Oxford University Press, 2001, p 391.
[10] My Letter to the Faculty of October 2006, *passim*.
[11] This prognosis is less gloomy than it sounds, of course, since I am talking here only about the incremental positions that will be funded from the unrestricted resources of the Faculty and the University. There will doubtless be (indeed

University and as a Faculty we have been planning for expansion in the sciences for more than a decade, for two reasons: the changing nature of scientific research, and the need to refresh our approach to teaching and pedagogy in science. Yet before we discuss these reasons, let me address the question of why the humanities and the social sciences led the Faculty's expansion of the past decade.

Space

The availability of space has been an integral factor in how and where (both in disciplinary and physical terms) the Faculty has grown. Thus in the 1990s, the conversion of the Freshman Union and Burr Hall into the Barker Center and the renovation of Boylston Hall, both anticipated and allowed the addition of humanities faculty. Analogously, the two major buildings of the Center for Government and International Studies and the ancillary houses of this complex that opened last year (even though *planning* had begun back in 1992!), allowed us to accommodate new colleagues in some social science departments. This construction and renovation made possible the first two waves of planned faculty growth. Certainly, not all departments in the humanities and the social sciences gained equally, yet it is true that considerable faculty expansion was realized in these new and renovated buildings.[12]

By contrast, both planning and building new space for the natural sciences and engineering was both slower and more challenging. In these areas, incremental faculty FTEs that had been enthusiastically authorized remained unsearched-for and unfilled, simply because we had nowhere to put new colleagues. Before any significant new laboratories could be constructed, a large underground garage had first to be built in the North Yard to free the land from surface parking. Then, considering the relatively high per-square-foot costs of new laboratories, we had to await the flow of new resources from

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there already have been, during this academic year) gifts of new endowed professorships in many disciplines, that will allow net growth in a number of areas.

[12] Of course the availability of new space has not mapped exactly on the growth of the Faculty, and there are still several departments in the humanities and social sciences, such as music, statistics, psychology, and anthropology (in the last two cases, sub-disciplines like cognitive psychology and biological anthropology having become more experimentally-based and therefore more space-intensive) that are still quite constrained.

the capital Campaign before we could prudently take on the debt for this construction. So the "third wave" of faculty growth, that requires new buildings for the sciences and engineering, is only now underway. The Biological Research Infrastructure building was finished last summer, the Laboratory for Integrated Science and Engineering is scheduled to open later this year, and the Northwest Building will be ready for its first occupants in the late spring of 2008. Within the sciences, only the Division of Engineering and Applied Sciences (now SEAS) was able to grow significantly over the past decade, thanks partly to the gifts that allowed us to build Maxwell-Dworkin. The further planned growth of SEAS had to wait for new construction.

In summary, the Faculty's expansion since 1991 reflects the consequences of needing finished homes for new colleagues *before* we invite them to Harvard. Thus, over the past nine years, we have added 37 faculty members in the humanities, 26 in the social sciences, 22 in the SEAS, but only 14 in the physical sciences, and 9 in the life sciences (see Figure 4).

The scientific landscape

Across all divisions and departments of the Faculty, the trend towards cross-disciplinary collaboration has never been greater, and the possibilities for these collaborations only increase as we add faculty to our ranks. The more complicated the problems are, the more strength across disciplines is required to solve them. A larger Faculty allows us to cover more of the intellectual terrain, and enables us to offer our students more at both the undergraduate and graduate levels.[13]

The challenges of cross-disciplinarity are particularly acute in the sciences, where work in many areas now requires physically larger efforts: bigger groups of

[13] Thus Dean Skocpol has noted: "Our most pressing need in the Graduate School [is] for . . . faculty positions [that] are transdisciplinary. In all divisions, these are growing rapidly in interest to Ph.D. students who see new research and teaching opportunities . . . from film studies, humanistic social studies, and comparative literature in the humanities; to chemical biology, systems biology, biophysics and bioengineering in natural science; to political economy, historical social science, behavioral psychology, social policy, business economics, and health policy in the social sciences."

collaborating faculty and students, shared specialized facilities, and more expertise from neighboring disciplines. To give one example, the technological revolution of the past thirty years means that Harvard can no longer maintain an engineering school that is much smaller (and covers much less of the intellectual territory) than those of Princeton, Stanford, or Caltech. While we have flourished with a small-but-excellent Division for the past several decades, the increasing importance of the applied sciences to the life sciences, medicine, and public health, as well as to business and public policy, made us recognize that if we were not to miss the consequences of this efflorescence in the applied sciences we should have to mount a more substantial effort, still tightly connected to the life and physical sciences but also with closer ties to some of the professional schools. Much of that effort has yet to come to fruition.

Looking ahead, a larger Harvard science faculty must comprise a richer mixture of large and small science, of theoretical and experimental research, and of individual research groups and collaborative, boundary-crossing activity. For the evolution of science is being driven less by competition (though that will always be a factor) than by the changing character of science itself. Indeed, if Harvard is to lead in science and engineering, it will have to grow, both in the numbers of its faculty and in the capacity of its infrastructure.[14]

Some will ask, what can justify the level of investment that Harvard will require to expand science beyond its present disciplinary and physical boundaries? For we cannot and shall not diminish the arts and humanities, the social sciences, or our core areas of scientific strength, to achieve these ends. But apart from the intellectual imperatives, I must argue—as many colleagues already have—that the investment is also required by our teaching responsibilities, both now and in the future.

[14] Allston is, of course, part of the solution for this growth, since with the completion of our new science buildings in the North Yard we shall approach the limits of what can be done in Cambridge. But science and Allston are not synonymous. Harvard has more to bring to the new challenges of science than just real estate: it has the tremendous strength of the basic sciences in the FAS and the HMS, and it has the potential for applied work through the SEAS, the professional schools, and the Harvard-affiliated hospitals. There are compelling arguments for our expansion into areas such as regenerative medicine, the environment, and energy. Allston is part of this story, but certainly not the whole of it.

Science teaching

Teaching science in the FAS carries several challenges.

First, *we must teach our science concentrators more effectively*. Science teaching is often necessarily hierarchical ("How can I teach genetics before DNA?", "How can I teach fluid dynamics when they don't yet know Newton's Laws?"), and we need faculty who are comfortable teaching at every stage. Complicating this process is, of course, the fact that the sum of what we believe students should know is increasing daily. We have constantly to ask what we can *not* teach, in order to make room for what we must.[15] Further, we know that we must sharply increase, most obviously in the sciences, the opportunities for what are called "hands-on experiences" or, as described in the *Report of the Task Force on General Education*, "activity-based learning." For the past century at least, the teaching of science in both high schools and colleges and universities has involved laboratory courses or laboratory exercises associated with lecture courses. These laboratory experiences both illustrated the concepts that a student had learned from lectures and from books by bringing the ideas to the bench, and taught the manipulative skills that the *practice* of science demands. Yet over time these activities became mere hoop-jumping exercises, their higher purpose—of relating idea to experiment—was being eroded, and the gap between undergraduate practical exercises and a "real" research project, widened. Many reports in recent years have highlighted this problem,[16] and have pointed to the need both for "hands-on" learning throughout a student's undergraduate career, and for more opportunities for undergraduates to undertake real research projects in the research groups of the faculty. These calls for action have not gone unheard, and new FAS courses being developed in the life sciences and the physical sciences aim to address these issues. But such courses are, naturally, relatively resource-intensive and

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[15] My own recognition of this problem came when I realized that more than three-quarters of the material in a course for senior undergraduates that I had taught on and off for fifteen years had not—when I taught it for the last time—even been known, when I began.

[16] For example, the National Academy's *Bio2010* report ("Transforming Undergraduate Education . . .") of 2003, and our own recent report of the University Planning Committee on Science and Engineering.

require the efforts of many collaborating colleagues.[17,18] This demands an increase in the number of faculty.

Second, *we must bring more of our non-science students to a more confident engagement with science.* Like great literature, great science belongs to everyone. But in today's world, a mere passing acquaintance with science and technology is not enough. In our daily lives, we need, use, and are affected by innovations and ideas from science and technology, and we must give our students more than a passing and superficial acquaintance with these issues. Growth in knowledge and understanding is certainly not limited to the sciences, but we must bring our educational commitment and standards (for non-science concentrators) up to the higher level that we are achieving in the humanities and the social sciences (for science concentrators).[19]

Our divisional deans, musing on the problems of science education and the challenges of devising a new program in General Education, have worried that we, like many universities, are seeing a greater polarity between "scientists" and "non-scientists." The undergraduate curriculum is the first, front-line bond between what *all* of us do in our different departments and divisions, and we are surely now in a good position—at the moment of reshaping undergraduate education—to help to bridge these intellectual divides. The world's problems, the history of these problems, and the inventions, tools, and creativity that we bring to understanding them, are neither disciplinary nor even narrowly divisional. Happily, there are already courses in the catalog that explore, for example, the philosophy of biology and conceptual puzzles in evolutionary biology and genetics, the effect of brain chemistry on social behavior, the environmental and political

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[17] Thus the new Life Sciences 1a and 1b course sequence, now in its second year, integrates material (and involves colleagues) from *five* different departments: Biological Anthropology, Chemistry and Chemical Biology, Molecular and Cellular Biology, Organismic and Evolutionary Biology, and Psychology.

[18] In the past couple of years, we have made some good progress in easing a student's search for an opportunity to join a faculty research group, and there are heartening signs that increasing numbers of departments now *expect* faculty to welcome undergraduates into their groups.

[19] Currently, only 13% of humanities concentrators take a non-Core course in science, whereas 40% of science concentrators take a non-Core course in the humanities (excluding language courses). Only 17% of social science concentrators take a non-Core course in science, whereas 60% of science concentrators take a non-Core course in the social sciences. So it seems our humanities and social sciences concentrators are shunning science, at least beyond their requirements. In contrast, the balance between the humanities and the social sciences is much more even, with about 85% of humanities and social science concentrators taking courses in the other division.

dimensions of global development, the historical interplay between science and religion in the Enlightenment, and the challenge of translating science into healthcare delivery for the poor. The program in General Education proposed this year encourages the development of even more courses of this kind. Such courses can help to bridge the chasm, but only if each end of the bridge has a firm foundation.

Third, *we must continue our efforts to improve the quality of our graduate students' education in the sciences.* What is true for our undergraduates is no less true at the graduate level, and a narrow disciplinary training will no longer serve our graduate students well. Even though no one would suggest that "core" teaching and research within the formal disciplines should be sacrificed on the altar of inter-disciplinarity, here too is an opportunity that must be grasped.

Research *and* Teaching

Before I leave the question of science teaching, let me digress for a moment. For the aim of this letter is to discuss how the growth and renewal of the Faculty can achieve our fundamental ends: to create knowledge through discovery and scholarship, and to propagate it by educating students. I belabor the obvious because *we are not and should not become a research institute or a collection of research institutes*. Education informs our research, and our research enriches what and how we teach. Or, to plunder Kant's dictum: research pursued as an end-in-itself is empty, and education without the animation of research is blind.

Yet of course I cannot deny that there are forces that seduce us away from education, towards research. We all experience these pulls, and the recent report of the Task Force on Teaching and Career Development[20] exhorts us as a Faculty to engage more fully with our colleagues and our students in pedagogical creativity, innovation, and experimentation, as well as to recognize and reward excellent teaching in ways that are

[20] *A Compact to Enhance Teaching and Learning at Harvard*, January 2007.

more equal to those that greet the spoils of discovery. Recognizing this, too, the recent report of the University Planning Committee on Science and Engineering was gratifyingly unambiguous in its first declaration: "Transform the teaching and training of students in science and engineering." Nearly half of Harvard's undergraduates arrive here professing an interest in science, we must not discourage or disappoint them. We shall need them and, without immodesty, so will the nation and the world.

Why *is* there such tension between teaching and research? First, faculty in all disciplines experience crushing demands, and since both funding and time are in short supply, the tension is real. Second, it takes ever more time and energy to create new courses. In the departments, inter-disciplinarity has complicated responsibility for curricula. Courses of study, even in graduate programs, are much less readily dictated by professional training norms, and responsibility is often shared across departments. So simply trying to understand one's teaching obligations and opportunities—never mind meeting them—is harder. Third, we have encouraged and developed wonderful research centers[21] that stand outside departmental orbits and that have no formal institutional role in teaching. (We make efforts to change this, but the problem can sometimes seem Sisyphean.) Even so, almost paradoxically, many of our most distinguished and promising scholars—across all divisions of the Faculty—are also our most insightful and uplifting teachers.

I believe that we need to be far more self-conscious and frank about the tension between our goals in research and teaching,[22] and about the rise in intellectual specialization that many of us have come to take for granted. We must be determined to resolve these questions, and to ask how a larger Faculty could help. So I end this letter by asking how we might gauge the consequences of our investments in the Faculty.

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[21] There are now more than fifty centers, institutes, and initiatives in the FAS (fourteen having been added just in the past six years), each of which requires faculty leadership, incremental funds, and broad faculty involvement and support.

[22] Who was it who said: "To discuss teaching and research separately is about as sensible as proposing to tune half a piano"?

V. How should we measure and appreciate the effects of faculty development?

I do not doubt that, as a Faculty, we shall continue to identify and recruit new colleagues of the highest scholarly achievement and potential. That success follows the care and rigor with which we search, recognizing that each new faculty colleague is both a finite and (we hope) a long-lasting investment. When the current cycle of faculty hiring is complete, we shall have expanded the intellectual horizons of the Faculty, not merely duplicating, nor simply augmenting, the traditional span of disciplines and subjects. But we shall not have realized our goals unless the development of the Faculty—that is, both its growth and its continual renewal—has been matched by specific and sustained improvements in the education we offer.

Let me suggest a tentative list of what some measurable consequences of increasing the number of ladder faculty might be.[23]

- a research experience (or other "capstone") for every undergraduate;
- more frequent, and mutually more engaging, interactions between students and faculty;
- a lower attrition rate of intending science concentrators, and a more informed and confident sense of science among *non*-science concentrators;
- continuing high standards in the education of our science concentrators in the humanities and social sciences, and of our non-science concentrators in science;
- a commitment to graduate education that accepts and applauds movement across intellectual boundaries;

[23] Many of these are, of course, unapologetically borrowed from the work of others.

- a more intense focus in our centers, institutes, and initiatives, on *both* teaching and research, matching that in our departments;

- clearer expectations, and more tangible support and rewards, for the continued development of teaching skills and creative curricular contributions by faculty at all career stages;

- more opportunities for collaboration amongst the faculty from different disciplines and across divisions, in both scholarship and teaching; and

- a lower burden of committee and administrative work.

Many will say that these are all obvious aspirations, and are little more than a bland list of today's desiderata. Yet without explicit goals, how shall we know whether the very large investments that we are making and planning have served well to position the Faculty for the coming decades?

VI. Envoi

Over the long term, the relative rankings of academic institutions (deeply flawed as such lists can be) are quite variable. It is not that universities are intrinsically fragile, for they certainly are not. Yet all universities require constant vigilance and effort, to ensure that the caliber of the education they offer and of the scholarship they generate remains at the highest level. In the fourteenth century one could have claimed that the University of Pisa led the educational world. But by the fifteenth century it had waned almost to non-existence, then to be rescued by the Medici in the sixteenth. (Galileo joined its Faculty in 1589.) Then Napoleon made it a branch of the University of Paris, and only in the late nineteenth century did it again recover its distinction and its independence. Mere longevity is not the question, and Harvard, too, will surely continue to exist for a very long time. My concern is not with Harvard's life-span, but rather that we not become complacent about our present gratifying position in the global hierarchy of higher education. Very many universities have begun sternly to scrutinize their present, and imaginatively to shape their future.

We must do no less ourselves, now.

With my best wishes and thanks,

Yours sincerely,

Jeremy Knowles

Jeremy R. Knowles
Dean of the Faculty of Arts and Sciences