Duke University at the Millennium

Provost John W. Strohbehn
January 1999
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Duke University at the Millennium: Executive Summary

Duke University has moved rapidly over the last several decades to approach a top tier position in higher education, but we still are not where we want to be in most intellectual areas. As we take our next steps we would do well to be guided by the vision of our founding benefactor, James Buchanan Duke, who 75 years ago laid ambitious plans for a top-ranked research university with a strong liberal arts core. As we move into the next century, we need to set realistic yet equally ambitious priorities that support the growth in quality for all our schools. New resources will be needed for jumpstarting and sustaining Duke’s movement into the highest echelon. We look most particularly to the Capital Campaign for these funds, but also to increased sponsored research and creative use of the recent two-tier tuition increase in Trinity College.

Looking toward the future, we need to adopt the twin paradigms of building on strength and finding our foci. The biomedical sciences, broadly defined, constitute our most robust area, and one in which Duke is clearly in the top echelon in the country. Given that there is no field making more exciting breakthroughs than the basic biomedical sciences, Duke should concentrate on this broad area. Here we should support and expand on the strengths in Medicine; pay particular attention to the quality of the basic biomedical sciences (which are strong but could be even stronger); support interdisciplinary work, which includes the top-ranked program in biomedical engineering as well as the field of “ecology, evolution, and behavior”; accommodate the growing strength of cell and molecular developmental biology in Arts and Sciences; consider the consolidation of zoology and botany; and strengthen ecology. Two new interdisciplinary areas show special promise. The first is the proposed genetics institute, which could draw on almost all areas of the campus given its breadth and implications. Chancellor Snyderman envisions this as a $100M undertaking. A second but smaller university program that is rapidly developing is the cognitive neuroscience initiative, which will consist of two centers now being formed: the Brain Imaging and Analysis Center in the Medical Center and the Cognitive Neuroscience Center. This area has the potential to increase dramatically our understanding of the mind and its functions.

The humanities at Duke have enjoyed high rankings in the last several years but we need to reinvigorate certain departments and seize the opportunity to reorient intellectual directions, lest we lose the ground we have gained. English must be rebuilt and key appointments made in romance languages and philosophy. A proposed new initiative is the creation of a humanities center—or, more expansively, an interdisciplinary center for the study of ideas and society, with a broad focus including as one component African and African-American issues. While we have most of the resources needed for rebuilding the humanities departments, new resources are needed for the interdisciplinary center. To be minimally successful we need resources on the order of $500K for an operating budget, or an endowment of $10M. An even more
exciting center may be possible if Trent Hall is discontinued as a residential facility and is renovated to include an intellectual center. This step, which would require additional support of about $10M, would allow us to create a center that matches those at the best universities in the country. In the area of the arts, Duke should concentrate on enhancing our arts facilities and programs with the purpose of enriching the liberal arts experience of Duke students. A major step will be the construction of a new museum over the short term. Over a longer term, Duke should prioritize the creation of an integrated arts center.

The social sciences, broadly defined, also constitute a vital intellectual area for Duke, in part because of the balanced strengths in Arts and Sciences and the professional schools. In addition to the traditional departments in Arts and Sciences, which are generally well ranked, the Fuqua School of Business Administration, the Law School, and the Nicholas School of the Environment are highly rated and contribute heavily to the overall strength of the social sciences. Finally, the Sanford Institute of Public Policy Studies and the African and African-American Studies program are also highly respected. This broad area calls for attention because of the importance of major world changes in politics, economics, and the environment—all critical to the global human welfare—and these issues dictate an interdisciplinary, international approach. Duke is well positioned to move into the top echelon in the social sciences, and I strongly endorse a university-wide effort. To move the social sciences to an echelon comparable to that of the biomedical sciences will require ten to fifteen new positions in Arts and Sciences, in addition to the five planned through the two-tier tuition initiative, and about the same number in the professional schools. The most important area to focus on, as agreed to by all the deans affected, is the rebuilding of the economics faculty so that it competes with the best in the country. As a benchmark, adding 15 economists would add about $2.5M to the operating budget, equivalent to the income from a $50M endowment. Building strength in other social sciences departments within Arts and Sciences would require about $1.2M to support 10 positions, or about $25M in endowment.

When we look at the physical sciences, broadly defined to include engineering and information technology, the rankings tend to be lower than those of the areas discussed above. This is primarily a resource issue. Because of Duke’s endowment, which is small relative to the universities to which we compare ourselves, the physical sciences are seriously underfunded. The resource challenge, of course, stems from the fact that the infrastructure costs for the physical sciences are much greater than in the other fields, except for the biomedical sciences. Even so, all the physical sciences in Arts and Sciences are now ranked just above the 25th percentile; hence, these departments are very solid, with some excellent faculty, and are well positioned to move higher in the rankings. In most fields the physical science departments have about 20 fewer faculty than the highly ranked departments nationally. Thus, the strategy needs to be long term and most likely fulfilled in several steps. The first important step is to have a specific, carefully considered plan for the sciences, without which it will be difficult to attract the best scientists to Duke. (This was the strategy for the humanities several years ago, and the well known fact that Duke was focusing on this area did succeed in attracting a number of stellar faculty.) I propose that Duke recruit 20 new senior faculty over the next five to ten years in the four core departments of chemistry, physics, mathematics, and
computer science, in addition to the 11 positions to be funded through the two-tier tuition plan. This strategy will increase the operating budget by about $5M and require start-up costs on the order of $15M; approximately $100M of endowment would be required to cover the additional operating costs. Clearly the feasibility of this recommendation is critically dependent on the campaign. In addition, the faculty must be encouraged to bring in more resources through sponsored research.

Duke’s Engineering School is on the small side compared to the well-known schools. Princeton has shown that a small engineering program can be highly ranked, and Duke should follow this paradigm. Duke concentrates on four areas, with one of them—biomedical engineering—having attained the top echelon. In my opinion, Duke now needs to pay particular attention to the fields of (1) electrical and computer engineering and (2) mechanical engineering and materials sciences. Over the next five to ten years, the school should be allowed to grow the faculty by around 20 positions without growing the undergraduate majors. The costs here will be similar to those of adding 20 faculty in the sciences, and additional endowment on the order of $100M is needed, though sponsored research and non-campaign resources should provide some support. While the school can grow slowly based on present resources, a transformation will require major campaign gifts.

The educational experience that we offer our undergraduates is highly ranked, but not what it could or should be. Although there are many positive aspects, on many markers we fall short. We must strengthen the intellectual rigor of our program through a revised curriculum (including the reinstatement of a foreign language requirement), make sure that our students’ classroom instruction is provided to a high degree by our regular rank faculty, articulate expectations for excellence in teaching, develop a more robust system for evaluation of faculty teaching, rework the writing program, support the work of the new Center for Teaching, Learning, and Writing, and institute annual reports from the deans to the Board of Trustees on the quality of undergraduate academic life.

Our graduate students, who are of increasingly high quality, enhance the experience of both faculty and undergraduates. Improvements needed in the area of graduate education include more effective utilization of graduate students in the classroom, more uniformly effective teacher training programs, and more systematic data collection on job placement of our Ph.D.s. Although Duke has downsized in the Graduate School for good reasons and to generally good result (especially in the area of improving the funding packages for our students), some of our best programs have been affected and the number of students per faculty is falling below a level that provides a good experience for students and faculty alike.

Diversity of student and faculty populations must be maintained as a top priority; it is essential for the quality of the education we provide all our students. In the long term, the population at large should be mirrored on the Duke campus. As we seek to increase the presence of underrepresented minorities at Duke, we should emphasize not only Duke’s catch up position as a southern institution but also the intellectual reasons for diversity, mainly the exchange and debate over ideas. At the same time we must examine
the barriers that impede learning from diversity, ranging from our financial aid policies to classroom climate issues to residential life.

I offer these thoughts and recommendations as a guide to conversation about some of our most salient and pressing issues, not as a finely honed plan of action. Fulfilling James B. Duke’s vision for this university means becoming the best that Duke can be. The “blueprint” for progress that I discuss in the pages of this document is not inexpensive, but with a successful Capital Campaign and the support of the faculty and the Board of Trustees, we should have the resources to permit the attainment of many of these goals. Our ultimate goal is nothing less than the realization of what Terry Sanford termed “the outrageous ambitions” of Duke’s leaders throughout its history.
I. INTRODUCTION

As the world (or, more precisely, that part of the world that embraces the western calendar) focuses on the year 2000, as if it portended some great significance, a perspective on the position that Duke University currently occupies, and the issues it confronts, seems timely. Most importantly, major changes in global economies and politics, the demographics of the United States, and the world of higher education present special challenges to the research university in the late twentieth century and demand a response. Having been immersed in Duke affairs for more than four years now, I recognize why a "state of the union" address might more logically be delivered at the end of one’s tenure rather than at the beginning: I find the time is right, then, in this my last year as provost, to try to articulate Duke’s place in the universe of universities. The thoughts on directions that Duke University should be considering are mine, but they have been informed by discussions with a number of others including faculty, students, deans, and senior administrators. I would also like to thank, in particular, members of my own staff: Judith Ruderman, Jim Roberts, Lew Siegel, Cathy Davidson, Bruce Kuniholm, and Charles Putman.

Shaping Documents

Three of the internal documents that have shaped much of Duke’s history have served as touchstones for me over the last four years. In the order in which I will discuss them, these are a talk to the Board of Trustees by Phillip Griffiths—provost at Duke from 1983 to 1991—entitled “Retrospective and Prospective: Duke University into the 90s” (May 10, 1991); the founding Indenture of Duke University, signed by J. B. Duke in December 1924; and Duke’s strategic plan, Shaping Our Future, developed by the
faculty and administration and completed in October, 1994, shortly after I arrived at Duke. I begin by briefly noting some of the observations in Phillip Griffiths’ talk since they serve as a useful benchmark and also give a sense of the rate of change in the higher education environment.

"Retrospective and Prospective"

At the close of his tenure as Duke University provost, Phillip Griffiths noted that nationally the ‘70s and early ‘80s were tough on higher education in general, after many boom years, and that Duke’s strategy of “retrenchment” reflected a standard practice of the times. These cutbacks had a particular impact on the undergraduate and graduate programs in Arts and Sciences, while in contrast, the Fuqua School, the Medical Center, Law, and Divinity were strong and continued to flourish. Griffiths credited President Terry Sanford with recognizing how critical it was to “seek as new faculty members only those who have established reputations of world class, or who come to us as assistant professors of tremendous promise.” The focus was on bolstering “those fields at the heart of the academy—the sciences, the social sciences, the humanities, and engineering,” the objective being to “cross the threshold” and “join the rank of universities in the highest echelon.” As expected, in 1991 Griffiths ranked Harvard, Yale, Princeton, and Stanford in the first echelon; his second echelon, perhaps more problematically, consisted of Cornell, Columbia, Penn, and Brown, and a third included Johns Hopkins, Northwestern and Dartmouth.¹ He noted that generally Duke was considered to be in the second echelon.

¹ I would accept the first grouping, but would add Chicago based on intellectual impact. Even in 1991, I would have argued about the second and third groupings.
In my opinion Duke has overall become stronger and more solidly positioned during the intervening seven years since Phillip Griffiths left Duke, but we have not yet achieved the top echelon. Of particular note is the Medical Center, which, under Chancellor Ralph Snyderman’s leadership, is consistently ranked in the top five and has undoubtedly become one of the premier medical centers in the country. (We did not need *Time* magazine to tell us that, though national press of this sort is always welcome.) Since *U. S. News & World Report* began ranking professional school programs in 1990, both the Law School and the Fuqua School of Business Administration have ranked between seventh and tenth. Divinity Schools have the graciousness to refuse to play the ranking game (allowing many of them to argue they are in the top five), but Duke competes with the best of them. While Public Policy Studies is not a school, it is rated eleventh in a group of public policy or public administration schools and programs. Our undergraduate program, based on the *U. S. News and World Report* rankings, has moved from around 7th to consistently in the top five in recent years, though we fell from third to tied with three schools for sixth in the latest incarnation of these rankings. Even if somewhat superficial and flawed, these data appear to support that, over the last seven years, Duke has continued to prosper and to move closer to the very strongest universities. (One notable sign of our strength is the number of those universities that are attempting to lure our best faculty away.) Whether we deserve our reputation, or are now doing what we need to do to keep it, is the central issue to which I will return continually in this document.

**The Indenture—Founding Vision of Duke University**

Before looking ahead, I must first look back to the mission for Duke as stated by its founding benefactor, James Buchanan Duke, in 1924. Strongly influenced by the
vision of William Preston Few—Trinity president from 1910 to 1924, and then president of Duke University until 1940—the Indenture positioned the University in ways that are instructive to an analysis of our progress and our potential.

The creation of a new private university in North Carolina was envisioned as incorporating Trinity College as the liberal arts core around which to build a research institution with a much broader reach. Key aspects were to be religion and the tie to the Methodist church, the pursuit of excellence rather than size, a national as well as regional scope, and an orientation toward service and the active application of knowledge. In Article Seventh, Mr. Duke is quite clear about why he was interested in founding a new university:

I have selected Duke University as one of the principal objects of this trust because I recognize that education, when conducted along sane and practical, as opposed to dogmatic and theoretical, lines, is, next to religion, the greatest civilizing influence. I request that this institution secure for its officers, trustees, and faculty men of such outstanding character, ability, and vision as will insure its attaining and maintaining a place of real leadership in the educational world, and that great care and discrimination be exercised in admitting as students only those whose previous records show a character, determination, and application evincing a wholesome and real ambition for life. And I advise that the courses at this institution be arranged, first, with special reference to the training of preachers, teachers, lawyers and physicians, because these are most in the public eye, and by precept and example can do most to uplift mankind, and, second, to instruction in chemistry, economics, and history, especially the lives of the great of the earth, because I believe that such subjects will most help to develop our resources, increase our wisdom and promote human happiness.

This article explicitly states that J. B. Duke’s vision was for a university “of real leadership in the educational world.” Mr. Duke endorsed a broad liberal arts core as a basis for educating students, many of whom would continue their education in professional schools, and directed the trustees of the Indenture to spend “a sum not
exceeding $6M^2 in expanding and extending the university . . . for such purpose to the
end that said Duke University may eventually include Trinity College as its
Undergraduate Department for Men, a School of Religious Training, a School for
Training Teachers, a School of Chemistry,^3 a Law School, a Co-ordinate College for
Women, a School of Business Administration, a Graduate School of Arts and Sciences, a
Medical School and an Engineering School. . . .” It is very clear from the Indenture that
James B. Duke had in mind a research university of the breadth and stature of the very
best universities of that era— institutions like Harvard, Yale, and Stanford— whereas the
spirit of the Indenture precludes the models of Princeton, Dartmouth, MIT, or Williams
and Amherst.

Today, over 70 years later, there has been little substantive change from the
founding vision for Duke University. The professional schools and the Graduate School,
the undergraduate colleges and the Sanford Institute—all are strong, vibrant, highly
regarded, and nationally prominent. The only major change has been the decision to close
the Department of Education in fall of 1981, on the argument that it was not meeting the
same standards as the rest of the university. (Harvard and Stanford have maintained their
schools of education, while Yale closed its department in 1954.) I should note that the
undergraduate nursing school was also closed in fall of 1981— also part of the cutting
back to which Phillip Griffiths referred— largely because the strong presence of nursing

\(^2\) According to the Consumer Price Index $6,000,000 in 1924 is the equivalent to about $55 million today.
\(^3\) Professor Robert Durden surmises that J.B. Duke proposed a School of Chemistry, instead of a School of
Sciences, probably because he became particularly interested in the applications of chemistry to the
business of power production (personal conversation, Sept. 2, 1998). I note here the usefulness and
readability of Professor Durden’s book on the founding of Duke, The Launching of Duke University, 1924-
1949 (Durham: Duke U. Press, 1993), to which this paper is indebted.
education in the state’s public universities led Duke to the decision to deploy its resources elsewhere.

Duke created a Forestry School in 1938 and a Marine Laboratory the same year; both of them, while not specifically mentioned in the Indenture, certainly are implicit in its spirit. In 1991, recognizing that the effectiveness of these two separate units would be enhanced by combining them into one entity, and responding to the increasing concern in our society about major environmental issues both locally and globally, the University created a new School of the Environment, now the Nicholas School.

One additional aspect of the original plan for Duke that I believe deserves special notice is the Co-ordinate College for Women. Washington Duke, J. B.’s father, had already recognized that women should also have the benefit of a liberal education and be educated alongside the men: he donated $100,000 for endowment in 1896 if Trinity College would “open its doors to women, placing them in the future on an equal footing with men.” By 1924, about a quarter of the Trinity undergraduates were female. When we consider the educational environment in the 1920s and 1930s, most of the Ivy League was all male until the 1960s or 1970s. (Harvard and Columbia had associated colleges, Radcliffe and Barnard.) Stanford, founded in 1885, admitted women from the start; but in 1933 a quota of 35-40% women was put into effect, which lasted until 1973. Hence, in this respect, Duke was a more liberal institution than many of the older universities.

When we broaden the concept of diversity to include racial or ethnic minorities as well, Duke’s history is not as forward looking. However, a bright spot is the so-called “Bassett affair” of 1903, in which John Bassett, Trinity history professor and founder of

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the *South Atlantic Quarterly*, was vilified in the press for praising Booker T. Washington, and for speaking out in the pages of his new journal for racial conciliation. The security of his professional position, and his right to air his views, were reaffirmed by the college’s board of trustees in what has come to be seen as a landmark case in the history of academic freedom. Later, when Samuel DuBois Cook joined the faculty in 1966, he was the first black faculty member at any predominantly white institution in the South. Although Trinity College and then Duke University would not become a truly diverse campus racially or ethnically for many years, the wisdom and foresight of John Spencer Bassett, and the pioneering courage of Sam Cook (and those who hired him), should serve to guide us as we seek further to make our campus reflective of society at large (a topic to which I shall later return). I note as well in this context that it is to Terry Sanford’s credit that whatever limit to a Jewish presence on campus may have existed was lifted during his own presidency, a point made eloquently by Joel Fleishman in his eulogy for Terry last spring.⁵

In summary, it seems fair to conclude that our history provides the keys to our future, and that the vision for this new university, expressed so forcefully almost 75 years ago, has stood the test of time. Duke University’s presidents, starting with William Preston Few and including Nannerl O. Keohane, have embraced and articulated the vision of Duke’s founders. We are fortunate that the Indenture has provided us such a good compass.

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⁵ The University Archivist has found no evidence of formal or set quotas.
Shaping Our Future: Planning Document for the ‘Nineties and Beyond

The most recent university-wide statement on the strategic directions for Duke is the planning effort completed in October 1994, entitled Shaping Our Future: A Young University Faces a New Century. This document also makes the Indenture its reference point, noting that at the time of this gift the university was enjoined to pursue “excellence rather than size; quality rather than numbers—quality of those who teach and quality of those who learn. . . .” This vision has certainly been followed. For example, in 1991 the Board of Trustees established the budgeted maximum size for on campus undergraduate students at 5,925.

Shaping Our Future, a comprehensive strategic planning document, was first distributed to the faculty in 1994 (and is now available on the WEB at the address http://irplan.provost.duke.edu/shaping.htm). Given that this is the strategic plan under which Duke now operates, I recommend it to those of you who have not read it. Here you will find our first full-blown mission statement along with some history about Duke that includes summaries of earlier planning efforts, core commitments, and five strategic themes for the University.

In what may have been a significant change in administrative policy, more of the long range planning for this document was delegated to the deans instead of being conducted by the central administration. For the Shaping Our Future report, all of the schools updated their long-range plans while participating in dialogues with each other and the senior administrators. For good reason, then, the report claimed to provide “a valuable self-assessment and guide to the University’s ambitions based on individual school plans and selected plans for major academic and administrative support areas.”
This university-wide plan also discussed financial issues and expressed a real concern over financial constraints. This concern led to the conclusion that “growth by substitution must be our principal means of achieving quality gains in a world of constrained resources.” How accurate was this prediction? While the financial situation has not turned out to be as dire as the prediction of four years ago, when the forecast of a significant decrease in resources seemed reasonable, the real growth rate in our academic programs has been significantly lower than the growth rate we enjoyed in the late 1980s. In Arts and Sciences, for example, the real rate of growth in expenditure has declined from 9.4% to 1.2% per year. Despite this low growth there have been few major efforts at growth by substitution.

**Five Year Average Annual Growth Rate in Core Expenses Adjusted for Inflation**

<table>
<thead>
<tr>
<th></th>
<th>Average 1984/85 through 1988/89</th>
<th>Average 1993/94 through 1997/98</th>
</tr>
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<tbody>
<tr>
<td>Arts &amp; Sciences</td>
<td>8.0%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Fuqua School of Business</td>
<td>21.0%</td>
<td>9.2%</td>
</tr>
<tr>
<td>Nicholas School of the Environment</td>
<td>3.2%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Law School</td>
<td>7.5%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Divinity School</td>
<td>2.8%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Engineering</td>
<td>10.6%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Medical School*</td>
<td>9.9%</td>
<td>3.8%</td>
</tr>
</tbody>
</table>

Notes: All dollars were adjusted by CPI.
Core expenses are those over which a school has direct control and are calculated by subtracting each school’s financial aid expenses and required contribution to academic and administrative support costs from its total revenue.
*Data reflect unrestricted resources only, except in the Medical School, which is predominantly financed by other sources.

In the years between 1994/95 and 1996/97, Arts and Sciences had financial problems for several reasons: rapidly increasing financial aid costs; the construction of two new facilities, the Levine Center and the Sanford Institute (with the funding of the
Levine Science Research Center, in particular, being rocky); and, especially in 1996/97, a
decline in indirect cost recoveries from sponsored research expenditures that was not
anticipated in our budgeting. Fortunately the level of sponsored research has recovered,
and the costs of the facilities have been folded into the university budget in a way that
gives substantial relief to Arts and Sciences. With a more robust economy and
significantly lower tuition increases, the rate of growth in our financial aid budget has
declined, at least for the time being. In addition, fundraising across the institution has
been very successful in the last few years, in large part due to the efforts of President
Keohane, John Piva and his staff, and the deans and their own development staffs.
Finally, the gloomy predictions about major decreases in support for research and
education by the federal government (the Contract with America calling for 40% cuts in
support for research and financial aid) have not materialized, and there are no signs on
the horizon of any major changes. However, we cannot behave as if we have unlimited
means, given that federal indirect cost rates have been curtailed nationally and tuition rate
increases should and will be more restricted as a result of rising concern, particularly
among the middle class, about the cost of college.

*Shaping Our Future* also discusses "Fundamental Operating Policies." Of
particular interest to the schools was the change in FY 91/92 to a more universally
decentralized budgeting-planning system. Phillip Griffiths led the effort to provide for
Arts and Sciences the incentives and accountability long familiar to the professional
schools. The Academic Priorities Committee and the President's Advisory Committee on
Resources worked out the principles of management center budgeting through which this
decentralization was accomplished at Duke. This Management Center budget system
affords the deans, in consultation with their faculties, the capabilities and the incentives
to make strategic decisions for their schools, while leaving with the senior officers both
an oversight responsibility for school plans and a responsibility for fostering and
supporting university-wide priorities. In this system we try to create an atmosphere in
which ideas for university-wide priorities can be generated by senior officers, deans, and
the faculty.

As *Shaping Our Future* details, even though most of the institution’s non-medical
resources are primarily under the control of the deans, there are a number of funds
available to the central administration that have been developed deliberately to ensure an
appropriate balance between centralized and school-based resources. These funds
include:⁶

- The president’s discretionary fund of $1M annually.
- The Provost’s Academic Priorities Pool, $2.5M for investments in academic
  programs and shared academic infrastructure.
- The Provost’s Science and Engineering Fund, $1M for investment in academic
  programs and infrastructure specifically in the sciences.⁷
- The Academic Common Fund, $300,000 annually to provide seed-money for
  interdisciplinary programs.

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⁶ These funds have changed somewhat since 1994.
⁷ The Science and Engineering Fund has been augmented in recent years with $500,000 of annual support
  from the President’s Discretionary Fund and $500,000 of annual support from the Provost’s Academic
  Priorities Pool.
- Additional discretionary funding mechanisms provide varying amounts of income each year. Beginning with the 97/98 fiscal year, President Keohane now allocates the university's incremental unrestricted endowment and investment income to specific purposes. The infrastructure tax on invested fund balances held by schools and programs throughout the university typically provides discretionary income each year to the chancellor for health affairs and the provost. Finally, the Institutional Reinvestment Account, a device established in 1993 to maximize our investment earnings on the university's cash holdings, has begun to provide significant income to be used at the discretion of the president and will underwrite most of the costs of the current Campaign, relieving the operating budget. I would underscore, however, the small percentage of the University's annual budget that is available to the president and provost for special initiatives.
II. LOOKING TOWARD THE FUTURE: GUIDING PRINCIPLES

Having discussed a bit of Duke’s history, the vision of its founder, and some of the planning efforts of our predecessors, I turn now to some hard choices that Duke confronts as it moves into the next century. Anything defined as a vision for Duke must be, of course, a shared vision of the university community, not one held only by a particular individual. Clearly there are certain decisions that need to be made, and presidents, provosts, deans, and faculty groups will make some of those, with the final authority being the Board of Trustees. In my opinion, these decisions need to be heavily weighted by the founder’s vision.

As already stated, James B. Duke had a clear vision of the type of university he wanted to create as set out in the Indenture, on the model of Stanford, Harvard, and Yale; he was very clear in his aspiration to create an influential top echelon university that would compete with the very best. At the time Duke was created it did not have the resources of those well-established institutions, and that situation is still true today, but over the last 75 years Duke has continually improved and moved closer to being in the top echelon. This vision should continue to guide us in the future.

Operationally, what does this vision imply? First, it means that the senior administration should pay attention to and support the growth in quality of all of our schools. The intention of the decentralized management system, as I’ve stated, is to provide an environment for the deans and the faculty in which to make the critical intellectual and resource decisions with guidance from the central senior officers. In the academic vernacular, this is a “tubs on your own bottom” approach—the expectation being that all tubs can rise together, but probably at different rates. For example, the
business school, which was envisioned in the Indenture, was not created as the Fuqua School of Business until 1980 but has now become, some 18 years later, a recognized impact player among business schools nationally and internationally.

From an overall strategic point of view, one broad question is whether Duke should close any of its present schools—on the argument perhaps that Duke is under-endowed and the resources could be better used elsewhere—or create a new school because there is a good intellectual opportunity on which Duke is uniquely positioned to capitalize. In discussions with President Keohane shortly after I arrived at Duke, we made the decision that Duke should concentrate on strengthening its existing schools and programs—that creating any new schools would only stretch our limited resources. In particular we did not move forward with a recommendation to transform the Terry Sanford Institute into a freestanding public policy school. We also concluded that all of our present schools were contributors to our intellectual agenda. *Shaping Our Future* did point out that the School of the Environment needed special attention during this five-year planning period; fortunately, the wonderful gift from the Nicholas family has provided the resources to increase dramatically the faculty strength in NSOE. While NSOE has made major strides under Dean Christensen’s leadership, this school will continue to need extra attention to bring it to the level of quality that Duke expects. However, given the increased concern over local, regional, and global environmental issues, Duke has the opportunity to make a significant impact in this area, in particular if it continues to strengthen the School’s interactions with Arts and Sciences, Engineering, Law, and Medicine.
Another critical parameter has to do with the size of Duke. As I mentioned earlier, J. B. Duke also had weighed in on that score and underlined that the important factors were quality and impact, not size. I agree with the philosophy that size does not necessarily equal quality; but while we can give examples of some very small institutions that have major impact, in general there is a significant correlation between size and reputation as long as the quality is high. With respect to the highly rated private universities, Duke is about average in size when accounting for all faculty except medical (tenth of eighteen) but fifth largest for Arts and Sciences faculty. Hence, size is not the critical issue for Duke, and we should concentrate on quality. (See Appendix Table 1.) Mr. Duke certainly recognized that to achieve the status of the top echelon would take decades and maybe a century or more. We should remember this point, and realize that our weaker areas result mainly from resource constraints rather than faculty deficiencies.

Given the primacy of undergraduate education, both at Duke and the universities with which we compare ourselves, a major benchmark is the size of the undergraduate student body. Duke’s target for the academic year average number of undergraduates on campus is 5,925, which compares to the approximate target figures for Harvard at 6,500, Yale at 5,300 and Stanford at 6,500. It is my opinion, and that of the president as well, that the size of our undergraduate student body as approved by the trustees is totally appropriate, even if difficult to attain exactly. In fact, given infrastructure issues, increasing the student population might not result in increased resources for Arts and Sciences or Engineering.

Assuming the residential undergraduate student body target will remain fixed at 5,925, there is a secondary question about the mix between Arts and Sciences and
Engineering students. This split has been set at 5,036 students in Arts and Sciences and 889 for Engineering. The deans are very sensitive to these ratios, since a variance of eight students has a $100,000 impact on their budgets. (Half of an engineering student’s tuition is transferred to Arts and Sciences since the Engineering student takes half of his or her courses in Arts and Sciences.) I recommend no change in this ratio.

As we look toward the future, we need to keep an eye both on our core values—those articulated by our founders, reaffirmed in planning documents of the 1990s, and essential for our position among the very best research universities—and the niche opportunities for giving Duke University a distinctiveness within the top echelons. We are already part of an outstanding leadership group of American universities, but our progress has taken time and dedication to achieve and our position is never secure. If we wish to continue our rise in the ranks we must be committed to improving the institution and to making hard choices. Suggested improvements in our programs and rankings form the basis for most of my remaining remarks.
III. ARTICULATING DUKE’S NICHES FOR THE FUTURE

The Example of Yale

To the best of my knowledge, most universities do not, on a regular basis, state their university vision in much detail. Although, especially in the last decade, many universities have produced mission statements and strategic plans (usually with a five-year horizon), they tend—with a few notable exceptions—to concentrate on broad outlines. One important exception is Yale, which produced a document authored by President Richard C. Levin, dated October 26, 1996, and entitled “Preparing for Yale’s Fourth Century.” In addition to the broad, familiar statements of almost all documents of this type, the Yale document sets distinct priorities.

On the familiar side is the statement by Levin on the “two shared values that distinguish Yale from other great research universities: (1) a commitment to undergraduate education and (2) an emphasis on the education of leaders.” I have yet to be at a university that does not make that statement in one form or another. One could argue over whether the universities that claim this distinctiveness are truly great, but all of our peers voice this aspiration. Certainly Duke has pronounced these values in much of its literature. Another familiar point is Levin’s suggestion of two principles to guide future decision making: “(1) our programs should be shaped more by aspiration to excellence than a compulsion to comprehensiveness and (2) we should take advantage of the substantial interconnectedness among our schools, departments, and programs.” These two principles are also often stated by other universities and should guide Duke as

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8 Examples are Carnegie Mellon, Dartmouth, Johns Hopkins, and Emory.
well. In fact, an argument could be made that Duke formally embraces these two
concepts, as they are covered in *Shaping Our Future*, but in practice Duke is having a
hard time following them.

The unusual part of the Levin document is its identification of (1) the biomedical
sciences and (2) the humanities and arts as areas of “distinctive strength” to which Yale
will pay special attention. Levin conceives of these areas very broadly; for example,
under the humanities and arts he includes the fine arts schools (Art, Drama, Music, and
Architecture), the Law School, the library, and the museum in addition to the humanities
departments in Arts and Sciences. Similarly, Levin argues that the basic biological and
basic medical sciences, as well as the M.D. program, also are among the very best in the
country. President Levin’s essay is instructive because it is well stated and gives a good
benchmark on how one great research university sees itself and openly articulates its
vision. I offer a similar appraisal for Duke that focuses on the many areas to which we
need to devote our primary attention in the coming years. I begin my assessment by
highlighting the two areas that Levin has presented as Yale’s greatest strengths—the
biomedical sciences and the humanities—and then I will range broadly across Duke
University’s departments and disciplines. Although I have broken my remarks into
sections based on the traditional terms for areas of knowledge, key elements transcend
those broad disciplinary categories and are included in each section: interdisciplinarity,
internationalization, and graduate studies are three of these key overarching elements and
will be more fully discussed in separate papers.
Rankings

A word must be said up front about the entire issue of rankings. Several outstanding leaders in higher education who have visited Duke believe that Duke is obsessed with rankings, and yet I unapologetically started this piece with Provost Griffiths’ comments on Duke’s position relative to other universities. First of all, to ignore rankings totally implies that you have little interest in quality or how you are doing in relation to your peers. Duke may pay more attention to rankings than our peer schools do because we have only recently achieved rankings that move us close to the top echelon. However, the critics are correct to the extent that if we rely exclusively on rankings we may weaken our overall intellectual contribution, both to research and to undergraduate education.

We need to acknowledge the source and purpose of any ranking system. For example, U.S. News and World Report’s major purpose is to sell magazines. They have found that the college rankings are of great interest to readers, and this particular issue—the one rating colleges and universities for undergraduate education—is said to be the best seller of the year. Perhaps it is in order to keep the public interested that the magazine must change the rankings each year; surely the quality of undergraduate education cannot change as fast as these rankings do. However, U.S. News and World Report does collect a great deal of information about the colleges and the universities it ranks, and hence their rankings should not be ignored. I find it useful to look at the subfield rankings—for example, they rank the quality of Duke’s faculty as twelfth among a group of the 25 top national universities, and on undergraduate selectivity we rank
thirteenth. To me, those two rankings are more important to note than the overall ranking of sixth. Tables 2 and 3, appended to this document, provide the U. S. News data.

Even if flawed in their design, some of the rankings that we pay attention to undoubtedly contain some worthwhile markers. Generally, universities claim much more faith in the National Research Council rankings (Table 4.), which focus on the quality of the faculty and graduate programs, though even they have their limitations. These and other ranking systems—supplemented by comparative institutional research data—do help us to position ourselves in the universe of universities, and should supplement the ongoing self-examination and self-improvement in which any institution worth its salt continually engages.

**The Biomedical Sciences at Duke University**

To return to the Yale paradigm, I begin by considering if the strength of the biomedical sciences at Duke is comparable to the case that President Levin makes for Yale. *U. S. News & World Report* ranks Duke and Yale medical schools as tied for fourth, along with Penn. (Duke is also number four in the “honor roll” of best hospitals, with Penn at 11; Yale does not make this particular list.) Clearly that is a compelling indication that our strong medical center is a candidate for inclusion in our list of premier areas. If we look at the basic biomedical sciences, for the seven programs ranked by the NRC the average ranking for Duke’s programs is 13.6 compared to Yale’s average of 4.4⁹. By this measure, most of Yale’s programs are in or near the top five, while Duke’s programs are in the top 15. If we rank only the best five programs (since Duke is phasing

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⁹ For the ranking junkie, see Appendix Tables 2 and 3.
out at least one program), Duke's average is 10.4 compared to Yale’s at 4.4. Obviously having an average ranking in the top ten to fifteen is a major achievement and puts us squarely in Yale’s league. While clearly it is the strength of the Duke University Medical Center that puts Duke on the map in this broad area, Duke's intellectual contributions to the biomedical sciences are magnified because of the highly ranked programs in biomedical engineering, ranked 4th by the NRC. Duke's program in the field of “ecology, evolution, and behavior,” which involves contributions from faculty in botany, zoology, psychology, and NSOE, is ranked 3rd. As we look toward the future, I would advocate that we must continue aggressively to support and enhance these strengths. In particular, we need to pay more attention to the quality of the basic biomedical sciences.

Here I would point to some of the reasons for Duke to continue to move aggressively in this area. From a basic science point of view, there is no field that is making faster scientific breakthroughs than the biomedical sciences, from the Genome project and major discoveries in genetics to remarkable new treatments for cancer to the emerging field of the cognitive neurosciences that is revealing the mysteries of the mind. We are undoubtedly witnessing a renaissance in medicine and the biomedical sciences. Duke is already a major player in this arena, and in the future can open new vistas by moving expeditiously with its plans for a Genetics Institute and the Center for Cognitive Neuroscience. We need to continue to pursue vigorously these and other opportunities in the biomedical sciences. We should also recognize that this field is highly interdisciplinary; thus, we must continue to strive to break down the barriers impeding interactions across the university and create a climate that supports interdisciplinary work important to the biomedical sciences and health.
Generally, when we use the term "biomedical sciences" we think of such basic
departments as pharmacology, genetics, neurobiology, and biochemistry or medical
sciences such as radiology or orthopedics. However, there are faculty in many other
disciplines at Duke who are also making major contributions to medicine and health care.
For example, six tenured or tenure track faculty in the Institute of Statistical and Decision
Sciences (ISDS) are collaborating with the medical center in a number of cutting edge
areas from clinical trials to imaging. In the mathematics department, two mathematicians
are working on biological problems with grants from the NIH.

But there is more that we could be doing to stimulate productive work in the field.
The time seems right for a consideration of the fragmentation that we now have in the
biological sciences at Duke. (The time also seems right for a consideration of a
consolidated biology department.) We need to find ways to achieve a strong educational
program in ecology that capitalizes on our strengths in Arts and Sciences and NSOE. We
need to find a way to accommodate the growing strength of cell and molecular
developmental biology in our Arts and Sciences departments of botany and zoology,
among the very few still organized in that traditional dichotomy.

Finally, as we look toward the future, there are six new or revitalized programs
that will expand our contributions to medicine and health care. The first of these is the
fledgling program in cognitive neuroscience mentioned above, a joint program between
the medical center and the campus. On the medical side, an eminent director for the
Brain Imaging and Analysis Center, Gregory McCarthy, has recently joined the medical
school and another internationally recognized scientist, G. Ronald Mangun, has joined
the faculty as director of the Cognitive Neuroscience Center. This program will have a
core faculty in psychology but is expected to have appointments in computer science, engineering, and/or philosophy as well. Over the next few years we expect to grow to 11 or 12 new faculty between these two entities, and because of the outstanding strength of Duke's radiology department and its support for the university-wide program, along with the support from psychology and other departments, Duke has the potential to develop one of the very best programs in the country in a field of exceptional importance and promise.

Additional health-oriented programs are the new Health Policy Center for Law and Management, part of the Sanford Institute of Public Policy, and a newly-established Center for Child Policy, also housed in PPS. Recently, the Fuqua School has revitalized its program in health services management. In addition, the Kenan Ethics Program has as one of its major thrusts working with the medical center on medical ethics. Finally, the Nicholas School of the Environment includes as a major goal the creation of a vibrant Integrated Toxicology Center, again an effort undertaken in collaboration with the medical center. As these programs mature they will increase the already strong impact that Duke is making on medicine and health broadly defined.

In summary, the biomedical sciences are clearly in the top echelon and constitute one of Duke's premier areas. Building strength on strength is my recommendation for the future of this area and the institution.

The Humanities at Duke University

From the positive past attention in the media, one might think that Duke could also make the claim that its second area of major distinction is the same as Yale's: the humanities as broadly defined (by Yale). In the recent NRC rankings, five of the eight
Duke humanities departments are ranked fifth or better; the average ranking of the eight ranked departments is twelfth, which is identical to Yale’s nine ranked departments. If the two lowest ranked departments are excluded, Duke’s average is 5.2 and Yale’s 3.3. Thus, in the key areas of the humanities in Arts and Sciences we are very competitive with Yale. It is important to remind ourselves that in the late 1970s we could not make this statement about the humanities. The humanities provide a good example, therefore, of how Duke has targeted an area, invested resources in it, and dramatically improved it.

Since the early 1980s Duke has markedly—indeed, sometimes astoundingly—increased the strength of a number of humanities programs, including literature, English, French, Spanish, and religion, all ranked in the top five by the NRC. The major difference from Yale is that Duke does not have schools of art, architecture, drama, and music, all of which are strong at Yale. In addition, Yale has a top-rated library and an outstanding museum and art collection, not to mention its excellent law school. Duke has not invested as heavily in those areas, though we do have a well-ranked law school; thus we cannot make the case that we are distinctively strong across the humanities as broadly defined by President Levin. However, Duke is not Yale, and we need to set our own priorities.

Given this situation, what aspirations should Duke hold for the humanities for the next several years and for the long term? In the immediate future Duke needs to invigorate the departments in the humanities that have enjoyed the high rankings (and commitment of resources), lest we reach the crisis proportions we are experiencing in English, for example, where the raiding has been intensive and continual. Data prepared by Dean Chafe’s office reveal that in the five years between August 1993 and July 1998,
71 of our faculty in Arts and Sciences were wooed by other institutions, with 36 of those efforts in 1997/98 alone. Of these raids last year, 15 were successful and 21 failed. Especially noteworthy is the fact that a full thirteen of these 36 raids were of faculty in the five top-rated humanities departments, and seven of them resulted in losses of key faculty—the most visible of them being Stanley Fish, who in recent years has been pursuing opportunities in university administration. The fifteen Arts and Sciences faculty who have left are moving to schools such as Johns Hopkins, Rutgers, CUNY, Stanford, Columbia, Princeton, Michigan, University of Illinois at Chicago, Virginia, and Vanderbilt.

Our highest priority in Arts and Sciences is to recruit a number of outstanding senior (full and associate) professors to replace the losses in the humanities, with particular emphasis on rebuilding the English department. Key appointments are also needed in French, Spanish, and philosophy. One of the challenges in the humanities has been the major change in paradigms over the last thirty years. While the debates in the humanities have been contentious over the last decade, the humanities are also enjoying a resurgence of interest and a revitalization in areas of cultural studies, global issues, multiculturalism, and interdisciplinary reach to such other fields as philosophy, history of science, and postcolonial political theory. Given this trend, Duke has the opportunity to use its recent faculty losses to reorient its intellectual directions. In any event, our goal should be to rebuild our key humanities departments to the level where they can continue to have a major impact on the dialogue about the human condition. As part of the

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10 While we have lost key faculty that we regret losing, it needs to be recognized that we have also "raided" other schools. Overall in Arts and Sciences, we have made approximately 20 senior appointments over the last four years, including nine in the humanities.
rebuilding we need to find more scholar-teachers who are not only of star quality but who also are committed to undergraduate and graduate teaching and mentoring.

While there has been some turmoil in a number of humanities departments during the last few years, two humanities departments—philosophy and art history—have made significant strides during this period. Philosophy has appointed two stellar senior faculty within the last four years and is slated for one more senior hire. Art history initiated a new Ph.D. program in 1991, and has gone from 8 tenure track faculty in 1993/94 to 12 in 98/99. Two of these were tenured appointments that have significantly improved the department’s quality, and it still has two endowed senior chairs to fill. With these additions, art history will be comparable in size to several of the top ten departments in the field nationwide. Overall, if this year’s searches are successful, we will have made significant progress in strengthening the academic departments in the humanities.

On the other hand, as already noted, Duke has not developed professional or conservatory entities, such as a drama school, an architectural school, or a music conservatory. We do have, of course, a music department, a drama program, a major in dance, and a certificate in film and video. The Institute for the Arts is another good example of interdisciplinary programming at its most innovative. The American Dance Festival, internationally renowned, could be made more integral to Duke University, and more of a year-round resource. Finally, Duke has made a commitment to build a new museum, which will become an important resource for the art history department as for many other departments and disciplines across campus, and for the Duke and Durham communities as well.
The Task Force on the Arts, chaired by Jan Radway, challenged the university in 1997 to institutionalize innovative thinking about the place of the arts in the academic curriculum, and to deploy financial resources into the arts, among other recommendations. The University is now considering its options for creating exciting new spaces for the arts and is interviewing architects for the museum project. In my opinion, with the exception of art history and music, which have small Ph.D. programs, our thrust for the arts should be to enrich the undergraduate liberal arts experience with a balance of for-credit courses and extracurricular experiences. Duke does not have the resources at this time to compete with universities that have professionally-oriented programs and conservatories. Hence, the focus should be on supporting programs already extant, most heavily in the humanities departments. For example, I believe it is more important to increase the size and quality of the philosophy department than to create graduate programs in the arts.

At some time in the future, Duke will, I hope, be able to develop an arts complex that would include facilities for art history, studio art, drama and dance. Such a step would bring the art programs together, provide them more space, and permit synergies among the faculty and students, as well as with the American Dance Festival if that organization also moves downtown. Even though the Arts Task Force report was completed in June of 1997, the administration has not yet responded fully to all of the recommendations, in part because of its concentration on the museum project. The Academic Priorities Committee did review the report last fall, and the administration will make a more complete response this year.
I have mentioned that other areas in the humanities as broadly considered include the law school, the libraries, and the museum. Duke, as already noted, has a strong law school, generally ranked between 8th and 10th (Table 2.), and this school adds to Duke’s strength in the humanities. I would note that our Divinity School, which is in the top grouping nationally, also bolsters our strength in the humanities. Divinity is a key part of Duke’s doctoral program in religion and makes significant contributions to intellectual life on this campus.

With respect to libraries, Duke is ranked 24th. However, Duke was one of the major partners in establishing TRLN, the Triangle Research Library Network, whose roots go back to the 1930s, and the significance of TRLN should not be underestimated much less ignored. The holdings of this consortium are comparable to a number two ranking behind Harvard (though, of course, other libraries also multiply their power through consortia of various kinds). Under David Ferriero’s leadership, this connection with the TRLN libraries is being strengthened so it serves all four Triangle libraries better and more cost effectively. These efforts should make Duke competitive with the very best libraries in the country with respect to collections, though these efforts will not necessarily show up in the rankings. A major challenge for Perkins is the overcrowded facility, and the resulting problems for patrons in obtaining materials. Significant changes in the operation of Perkins are now underway with respect to issues of accessibility and efficiency and the integration of technology.

Another entity that supports the humanities is a good museum. We hope that a new museum facility will be a reality in the next few years, with the goal of allowing Duke to attract new collections; but Duke cannot aspire to have one of the top university
museums in terms of the strength of the collections in the foreseeable future. Instead, the major thrust of Duke's museum should be to enrich the academic experience for the undergraduates, graduate students, and the faculty.

The last area I want to mention is the Duke Press. Over the last five years, Duke has focused on revitalizing the Duke University Press, founded in the 1920s, and the recent external review was very positive about its achievements. Its particular strength is in the humanities (as well as in anthropology, media studies, and Latin American studies), where the Press has become recognized as an intellectual force, one that adds luster to our humanities focus.

_A Humanities Center Initiative_

While the major thrust in solidifying the humanities should be to rebuild the humanities faculty in the key departments mentioned above, I strongly advocate pursuing two new initiatives already under discussion. Further, I suggest that they may be best approached by combination into a single broad initiative. The first of these I will call a humanities center, but I conceive of it as more extensive in scope, including intellectual issues in the social sciences and sciences as well. Of course it would also reach across larger organizational boundaries, drawing in interested and talented faculty from various schools (Divinity immediately comes to mind). The reasons for advocating such a center are twofold: intellectual enrichment for our faculty and competitive positioning. At least thirteen humanities centers at top private universities, including Stanford, Chicago, and Columbia, and even many state universities like Michigan, Texas, and UNC-Chapel Hill (though fellowships at UNC are only for their own faculty), have the reputation of

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11 Many of these ideas originated in a proposal made by Stanley Fish.
making a major contribution to their institutions' overall intellectual atmosphere. The argument might be made that with the National Humanities Center in the Research Park, Duke has less of a need for one on its own campus. In fact, we do get many benefits from this nearby center. However, the presence of these local entities does not allow Duke to set its own intellectual agenda or have the strong impact on junior faculty that should be a key part of such a center at Duke.

While the creation of a major center needs to be discussed and debated by the faculty, let me describe some possible scenarios based on conversations with a number of people. These views will be amplified in the substantive report on this topic that Vice Provost Cathy Davidson, Dean Bill Chafe, and I are preparing, which we expect to release later this semester.

The main mission of such a humanities center should be to create an entity that significantly increases the intellectual conversation of the faculty; it does so by bringing major intellectuals and talented younger scholars to the campus for extended periods in an environment that will permit stimulating discussion among the visitors and Duke’s faculty and students. Such a program would have the added benefit of helping to attract the very best faculty and doctoral students to Duke, which, in light of the recent raids and downsizing of Ph.D. programs in the humanities, is an extremely important objective for Duke. Another argument for a humanities center at Duke is the extraordinary decrease in outside support for the humanities nationally, an estimated drop of about 40% in funding by government and private foundations. As a result, our faculty today have significantly fewer opportunities to study at major intellectual centers off campus than they did several decades ago.
Given the importance of signifying to our humanities faculty, and to the academic universe at large, Duke’s resolve to retain its strengths in the humanities—indeed, to substantially enhance them—we need to develop a multiple-stage plan. The first step we advocate is to put a small center in place by FY99/00. We expect that with a budget of $200,000 to $250,000, a program could be started with five internal faculty fellows and a distinguished intellectual leader at the helm.

For a given year there might be one year-long topic or two semester-long topics. While there would be some funds for speakers, we would hope that departments would support part of the center’s operations. The biggest challenge will be to find space for the visitors and fellows. Based on discussions with directors of other humanities centers, we believe that this bare bones effort will improve our intellectual climate but fall short of having a transforming impact.

A more robust model, and one similar to that at several of our peer institutions, requires a budget of about $500,000 per year, or $10M in endowment. This budget would include a director and associate director, five internal fellows and three external fellows, seminars, and a major conference, including a conference publication. This model would have a much greater impact on the campus than the first one, but it has greater facility needs as well.

A third model would be similar to programs at Stanford and Cornell, housing international and domestic visiting scholars and a number of our academic units in addition. This option would require a major grant or gift. While such a center may seem out of reach, the probable discontinuance of Trent Hall as an undergraduate residence facility presents wonderful possibilities for renovation into the kind of center we have in
mind, and even the accommodation of other, related activities. A prime example of a related program is African and African-American Studies, which is now in dire need of space. It would also be feasible to convert some of the Trent residential space for long- and short-term visitors, an option that might prove extremely attractive to foreign scholars, post-docs, and junior faculty.

The mention of African and African-American Studies brings me to a discussion of the second initiative referred to above, one that would surely have both a humanities and social science component: a center that focuses on African and African-American issues. The cornerstone for the initiative would be the John Hope Franklin Center. John Hope has committed his papers to Duke and an area in Perkins is under renovation for the collection. However, a number of people, faculty and administrators alike, have a vision for a larger intellectual agenda than only a repository for major African and African-American collections. In particular, interest is strong in an active center that would invite visitors for short and long stays and would sponsor seminars and conferences at Duke on African and African-American issues.

Under the leadership of Professor Karla Holloway, the African and African-American Studies program has enjoyed a period of great intellectual growth. This growth includes the recruitment of a number of outstanding faculty in the broad area of African and African-American Studies, the granting of tenure lines to this area, and remarkable increase in undergraduate student interest in the program. As a sub-field of English, African and African-American literature is now considered one of the best such programs in the country (in 5th place according to U.S. News & World Report). With these recent faculty appointments, Duke is in a position to become even more prominent. For
historical reasons, this is an appropriate and long overdue goal for Duke, and one I strongly support. The administration should work with Professor Holloway and the schools and departments to develop a long-range plan to achieve this goal.

As one considers the possibilities for a Humanities Center and the John Hope Franklin Center, their basic purposes emerge as being very similar. This fact has led a number of faculty and administrators to suggest that the most appropriate course of action is to create a single center, with a single director; the director would have the broad mission of developing vibrant intellectual programs along the lines of the humanities center model, but would also oversee and support programs and collections in African and African-American studies. In this structure, associate directors could focus on specific areas in order to help ensure the solidity and long-lasting viability of the enterprise. One reason I like this concept is that it does not segregate African and African-American studies from our larger intellectual purposes.

The goal here is to create an intellectual environment that will put Duke on the map as one of the most exciting places in the country for a faculty member to have a career. Recognizing that even a modest beginning would make an impact, Dean Chafe and I have committed to providing $100,000 each for the next three years to get this center started. We will expect the director of the center to secure funds from foundations and other sources. In the long run, we hope to build a sufficient endowment to have at least the resources for the second model mentioned. Without such a center, it will be difficult to hold on to our present strength, much less to improve it.
The Social Sciences at Duke University

A third broad area in the intellectual spectrum of a university is the social sciences. In my estimation the social sciences, defined comprehensively, are as well positioned for overall distinctiveness as the humanities broadly defined. However, the social sciences are not nearly as strong, taken together, as the biomedical sciences. I recommend that Duke move aggressively to continue the support and strengthening of the social sciences area so that it achieves a reputation comparable to that of the biomedical sciences.

Under the rubric of the social sciences I include of course the standard Arts and Sciences departments of economics, history, political science, psychology, sociology, and anthropology. (History is a field that transverses both the humanities and the social sciences, but in the NRC rankings appears among the social sciences.) I also place the Fuqua School of Business, the Law School, and the Sanford Institute of Public Policy in this larger domain. The Nicholas School of the Environment, too, has a number of faculty with training in the social sciences. Clearly the business school’s intellectual program is based on the core areas of economics, psychology, sociology, and political science, and hence is based on applied social science. Duke’s School of Law has strengths in corporate and business law as well as in psychology and political science; it is also building its program in environmental law and pursuing the strengthening of its faculty in economics. Hence, Duke’s Law School strongly benefits from and contributes to the intellectual environment of the social sciences.

While the Arts and Sciences departments mentioned above have not yet risen to the very top in the NRC rankings, most of them are very high, averaging about 20th, with
several key departments in the teens. Most importantly, over the last decade, political
science, history, and anthropology have improved significantly. From a percentile point
of view, half of the departments are now ranked in the teens and the others in the
twenties, according to *U.S. News and World Report*.

The situation in the broadly defined social sciences is similar to that in the first
area I discussed—biomedical sciences—in that in addition to the high rankings of Arts
and Sciences departments, Fuqua, Law, Public Policy Studies, and the Nicholas School
are also well regarded in their fields. Fuqua and Law are usually ranked between 7th and
10th by the *U.S. News & World Report*, for example\(^\text{12}\) (*Business Week* just rated Fuqua as
7th), and PPS has recently been ranked as 11th. Since there are very few environmental
schools, we are by definition in the top five.

Finally, Duke has more than thirty centers, large and small, that significantly
support the intellectual agenda for the social sciences. I have referred to some of these
already in the section on the biomedical sciences: the Center for Health Policy Law and
Management and the Center for Child Policy, both within PPS, and the Health Services
Management Center in Fuqua. Some of the other centers that support the social sciences
include those in Demographic Studies, Documentary Studies, International Development
and Research, the Study of Aging and Human Development, the Governors Center, Duke
Global Capital Markets Center, and North American Studies. The Women's Studies
program is a key player in this area.

\(^{12}\) See Table 2.
As I look toward the future, I advocate that Duke pay special attention to the social sciences and commit to identifying the resources to move the social sciences and related professional schools into the next echelon. The most important step in this regard, one supported by the deans of Arts and Sciences, Law, Fuqua, and the Nicholas School, is to increase significantly the quality and size of our efforts in economics across the schools. Last year, Deans Chafe and Adams and I went to Chicago to talk with faculty and administrators at the University of Chicago and Northwestern to learn how they built strength in this area. We agree that the core economics strength must be in the economics department itself, but the area of economics and finance is also critical to the business school as well as to NSOE and Law. (We recently lost one of our best economists to the Harvard Law School.) Among the four schools, on the order of 15 or 16 more economists would be needed to make a major impact in this field, based on the estimate of Dean Adams that Fuqua needs to add ten more economics and finance faculty. Assuming that half of the new hires should be senior faculty, in order to make a rapid impact, the increased annual operating costs would be about $2.5M, equivalent to the income from a $50M endowment. The deans are working closely together in a coordinated effort to enhance our reputation in the broad area of economics, including a joint strategy for recruitment.

Duke’s solid rankings in the social sciences have been achieved in most cases with a faculty size of about ten fewer faculty per department than we find in the top ten universities. Hence, a strategy of making a number of key appointments in such departments as political science, history, and economics should have a significant impact on their quality. In the two-tier tuition plan for Arts and Sciences approved by the trustees
last year, an increase of five new positions has been pinpointed over the next four years. In my opinion, on the order of ten additional positions will actually be needed to move the social sciences forward in Arts and Sciences, requiring about $1.25M in annual support or approximately $25M in endowment. These new positions should be closely coordinated with faculty appointments in Fuqua, Law, and NSOE.

One major reason for the recommendation to strengthen the social sciences as a whole is that we are clearly in an era of major social change. We are in the midst of a global revolution as totalitarian governments fall and the imminent threat of a global nuclear war recedes. There are major new challenges for international peace and cooperation. During this same period we have rapidly moved into a global economy, requiring new paradigms for the corporate, political, and policy structures. Given this period of revolutionary changes and the intellectual challenges they present, it is an auspicious time for Duke to focus on the social sciences with the commitment to providing the guidance and resources to strengthen our faculty and our schools, our departments and programs, in these areas. With a concerted effort by the faculty and deans, and successful fund raising in the capital campaign, Duke has the potential to become an impact player and major force in this broad field.

Another reason for this recommendation is the importance of environmental issues worldwide. With the growing strengths of NSOE and the programs in environmental economics and environmental law, Duke University should aspire to be one of the top universities in the social sciences side of the environmental debates in order to complement its contributions by hard scientists to the discussions. A third reason for focusing on the broad area of the social sciences is that it integrates well with two
intellectual approaches that Duke embraced early on and has over the years supported
with significant resources. The first of these approaches is interdisciplinary programs
and the second is internationalization. A companion piece by Vice Provost Bruce
Kuniholm will discuss internationalization more extensively; Vice Provost Cathy
Davidson, new in her position, will develop a similar piece on interdisciplinarity later on.
Here I will comment briefly on these two approaches.

In its SACS (Southern Association of Colleges and Schools) reaccreditation
review ten years ago, Duke made as its major theme becoming a university that was
particularly open to and supportive of programs that cross departments and school lines.
As it stands now, too many obstacles still impede our progress toward this end.
Scheduling and financing issues, lack of reciprocal doctoral requirements between
departments, and double service expectations for faculty holding joint appointments—all
these bureaucratic factors work at cross purposes with the interdisciplinarity that we
strive to foster. The most recent SACS self-study of 1998 also noted the importance of
removing barriers to cross-school teaching and learning, and the outside team of
consultants, headed by University of Virginia president John Casteen and president
emeritus Donald Kennedy of Stanford, agreed that Duke has great potential in this area.
The intellectual rationale is that more and more fields of academic and societal interest do
not fit easily into existing departmental or school intellectual categories, and universities
need to create a climate in which such intellectual endeavors can flourish. Duke appears
to have embraced this concept earlier than most, and has been more successful in
fostering such activities; indeed, the very construction of our West Campus in 1930
placed the professional schools in close proximity to each other, and to undergraduate
life, by facing them all onto the main quadrangle. To reinforce this tradition, in 1991 Duke appointed Dean of the Graduate School Lewis Siegel as vice provost for interdisciplinary activities. Recognizing now that this area needs more attention than the Graduate School dean can afford to give it, the administration appointed Professor Cathy Davidson as vice provost for interdisciplinary studies on August 1, 1998. While clearly interdisciplinary studies can cross all intellectual areas, many of the critical ones fall entirely or mainly in the social sciences as broadly defined. Examples of such collaborative programs were mentioned above.

The second approach, internationalization, has also been a strong focus for Duke over the course of its history, with a further strengthening in the last five years. In 1994 Duke created the position of vice provost for international affairs, which is presently held by Professor Bruce Kuniholm. While much of Bruce's portfolio is involved with the humanities, especially language and study abroad programs, much of it embraces the social sciences as well. An example is the Globalization and Democracy program, which is both international and interdisciplinary.

Realistically, setting high priorities on interdisciplinary studies and internationalization may compromise to some degree Duke's NRC rankings, since neither of these activities is formally ranked. For example, an economist who concentrates on the environment will probably have less impact on the reputation of the economics department than a person who makes a major breakthrough in theory. Nonetheless, these two broad intellectual thrusts deserve the continued commitment of resources.

As I have already stated, other important areas for Duke that are related to the social sciences include African and African-American Studies (and diversity issues in
general) and our schools of Law, Business, and Environment. As we develop our plans for strengthening Duke, we should pay special attention to these areas.

African and African-American Studies, as noted above, is strongly represented in the humanities but is interdisciplinary by nature and thus also critically involved in the social sciences. It is rapidly becoming one of our distinctive intellectual programs and the administration strongly supports it. I have already discussed the creation of a humanities center that would be broad enough to include social sciences topics as well, particularly if we can realize the more expansive, robust models.

The issues for the professional schools just mentioned are quite different. For instance, Law is primarily limited by its available resources, and it has few alternatives for building them. Clearly, small law schools can be highly rated: as an example, Chicago’s law school is about the same size as ours yet it has a better reputation, with a rank of number four (tied with Columbia) in U.S. News & World Report compared to Duke’s rank of eight. But smaller faculties can compensate less effectively for their areas of weakness, and Chicago is well known for its grooming of superior faculty scholars and its high number of publications per faculty member. Although Duke’s law school does not yet have this reputation in terms of its overall faculty, it is addressing its challenges. At this stage of the school’s history it needs a somewhat larger faculty to enhance its standing, particularly since we often lose some of our best faculty because we have only one faculty member in such cutting edge areas as international law.

Fuqua, on the other hand, is in a growth mode and has built up significant reserves. Its principal problem is attracting top-flight faculty in an exceedingly tight and high cost market. This school is being very aggressive in developing new programs based
on distance learning technologies—a risky and expensive strategy, but one with great
promise of success, even if that success is likely to be achieved more slowly than Fuqua
hopes.

_The Physical Sciences and Engineering at Duke University:_

**Physical Sciences**

The physical sciences, including (but not limited to) mathematics, physics,
chemistry, computer science, and statistics, plus engineering, is the last broad area within
a university's intellectual sphere. I will also give a nod to information technology (IT),
although I recognize full well that in part it constitutes an infrastructure area. As Dean
Gann has pointed out to me, the intellectual landscape is changing around IT and it is
beginning to form itself into a true academic discipline—an opportunity that Duke might
well explore. Some might argue that as an infrastructure issue information technology
should be packaged with the library, since it is a critical aspect of the library for the
future (and the present). I place it here for this discussion because the IT effort requires a
deep commitment to and an understanding of the basic technology that has been created
by engineering and the physical sciences.

It is unfortunate that Duke missed the opportunity to get on the bandwagon of the
physical sciences and engineering in the 1950s and '60s, when the federal government
made these initiatives a very high priority. One might contend that Duke should not now
invest in this area, since its heyday is over. I believe there are two arguments against that
alternative. First, we are experiencing a major revolution technologically as seen in the
impacts of the internet and the WEB across almost all segments of society. The engine
that has made this possible came from, and is still dependent on, the physical sciences. In
the future, many see major breakthroughs deriving from the physical sciences that will dramatically alter (and improve) the nation’s infrastructure, with “smart” systems affecting all segments of transportation, communication, and the building trades. Second, since interdisciplinary approaches are so important today, any deficiencies in the physical sciences and engineering will hamper the work of other researchers across the institution as they address issues in such key areas as the medical sciences and environment.

Duke Trustee Bob Richardson, Nobel Laureate in physics, has recently underscored both points in an email exchange with me on these issues. To illustrate his concern about Duke’s current position in the sciences and engineering, and our ability to contribute to developments in those fields, Richardson gives the example of the coming revolution in infrastructure:

In the next 20 years, the United States is expected to invest roughly 30 trillion dollars in rebuilding “infrastructure.” Highways, the water supply system, communication conduits, power and fuel supply systems will be rebuilt. Almost everything is either wearing out or is otherwise outdated and inadequate. The construction boom will be rather like that between 1880 and 1920. A central discipline will be civil engineering, a field that was “obviously” moribund just a few years ago.

Richardson speaks eloquently of the “intelligent infrastructures” that will necessitate both the management of a large amount of information and the development of standards and codes. The highways of the future, for instance, will have the capacity to monitor such phenomena as fuel levels, exhaust emissions, and weather conditions, and will communicate instructions directly to automobiles by means of distributed computers.
Richardson warns that "the legal, economic, and environmental issues [involved in such developments] have not been studied. The new challenges will present important opportunities for Duke’s professional schools. However, with civil engineering and computer science departments that rank 27th and 28th [in the NRC scale] it is hard to imagine how Duke can be very competitive." Our weaknesses in the physical sciences and engineering, he says, "are likely to be increasingly harmful to other portions of Duke. The call for multi-disciplinary work on the significant national issues is growing rapidly. Duke’s strength has been its flexibility to form multi-disciplinary teams. The absence of strong science or engineering participants jeopardizes Duke’s ability to compete for funds and recognition."

Indeed, with the notable exception of biomedical engineering, "a discipline which Duke helped invent," Bob Richardson says that our rankings in the sciences, math, and engineering are very serious problems:

"Metrics" such as the number of "NAS University" members matter. Duke has only 4 in the non-medical category and does not rank in the top 50. . . . It might not be obvious why the weak showings on academy memberships matters. It is a measure of how well the faculty are connected to the national discussions on major science and technology issues. It is a measure of how effective the senior faculty can be in mentoring younger colleagues. And it is a measure of how often Duke faculty are likely to serve on boards and commissions which select major fellowships and prizes for young faculty. . . . We at Duke are not in the loop.14

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13 According to the most recent U.S. News & World Report (1996), computer science is rated 25th.
14 Personal correspondence with Dr. Robert Richardson, November 14, 1998.
I trust, value, and share Bob Richardson’s opinions about the necessity for Duke to take bold steps in this area, recognizing the need for continuous improvement in building strategic departments. In general, it is much harder to build in the sciences and engineering than some other areas. Also, Duke has put fewer resources into the physical sciences, in relative terms, compared to other areas. One benchmark for support of a department or field is the size of Duke’s faculty in an area compared to the top five departments in the country—or top ten or fifteen. (Interestingly, the average size of a department in the top echelon is fairly constant regardless of which base we use.) Below is a comparison for four major science departments:

<table>
<thead>
<tr>
<th>Department</th>
<th>Average Size of Top 10</th>
<th>Size of Duke Dept.</th>
<th>Difference</th>
<th>Rank (NRC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>31</td>
<td>20</td>
<td>11</td>
<td>44</td>
</tr>
<tr>
<td>Computer Science</td>
<td>36</td>
<td>19</td>
<td>17</td>
<td>28</td>
</tr>
<tr>
<td>Mathematics</td>
<td>39</td>
<td>18</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>Physics</td>
<td>53</td>
<td>32</td>
<td>21</td>
<td>41</td>
</tr>
</tbody>
</table>

In every case, there are one or more universities ranked in the top 15 that have achieved the high ranking with a faculty the size of Duke’s. The major lesson is the importance of recruiting faculty who can put us in these ranks.

In fields such as physics, chemistry, electrical engineering, and material sciences, the infrastructure is expensive primarily because of the laboratory costs. While some of these costs are funded through federal and agency grants, the cost to the institution is still very high. From a resource point of view (as Phillip Griffiths understood) it is much easier to build a humanities department than one in physics or chemistry. In addition,
these infrastructure costs also make it more difficult (but not impossible) to convince
senior scientists or engineers to leave their present institution. First, the “raiding”
institution must agree to provide a large startup package that can run to $500K or more.
Then, even if such a package is agreed to, usually the scientist will lose a year or more of
laboratory time due to the complications of moving a lab, graduate students, post-docs,
and technicians. Hence, the prospective candidate may decide to decline an offer because
of the concern of losing momentum in his or her research. The universities with the best
financial picture—schools with the largest endowments—have a major edge in such
recruitment. This is also an area in which the public universities may have an edge over
the privates if a state has made technology a high priority and provides funds for the
facilities.

Duke now needs to sharpen its focus on the physical sciences. I will discuss
engineering separately but would note here that the overall strategy should include
engineering and the sciences since there are many opportunities for significant synergies
if the deans of both Engineering and Arts and Sciences create coordinated plans for the
two areas. This is happening at some level between computer science and electrical and
computer engineering, but the planning should be deeper and longer term. Other
important synergies could be achieved by cooperative efforts involving Environment and
Medicine, both with each other and with Arts and Sciences and Engineering departments,
in such areas as imaging technology, including signal processing, environmental
toxicology, and the development of biologically useful materials.

While there have been many cooperative efforts in the past, most of them have
arisen fortuitously and serendipitously when faculty members made connections after
learning of each other’s work. The Office of Sponsored Research, headed by Dr. Charles Putman, has also sought to foster research collaborations, in part through a directory of research interests. To maximize these connections, I recommend that we create a standing core group composed of faculty, the appropriate deans, and the Medical School’s vice chancellor for academic affairs to identify promising new areas and oversee collaborations.¹⁵

In addition to finding productive interdisciplinary areas, we must also pay close attention to the core science areas since those particular areas are the bedrock of the disciplines. I strongly suggest that we develop a long-range plan for bolstering the core departments. Almost all of the departments have some faculty who compare well with the best departments in the country. The key departments of chemistry, computer science, mathematics, and physics are ranked between the 25th and 28th percentiles, while the ordinal rankings range from 28th to 44th. I propose that Duke set its sights on moving all four of these departments to the 20th percentile over the next five to seven years. This type of change will not occur if our hiring strategy is based on a year-to-year recruitment plan that adds only one senior scientist every few years, which has been our practice.

Any plan to improve the sciences will require making a number of new senior scientist appointments. I think that Duke needs to add about five new senior faculty in each of the four core departments just mentioned. It will be important to the recruiting that this hiring plan be carefully thought through (but flexible to adjust when an outstanding scientist appears on the horizon) and widely publicized. It is far easier to hire

¹⁵ Such a committee was formed five years ago and made a number of recommendations that led to the cognitive neurosciences program. However, it was not a standing committee.
an impact scientist into a moderately strong department if he or she knows there is a vigorous plan to improve the department and the sciences in general. Right now Duke is moving forward based on a set of incremental steps. This strategy is likely to leave us where we are, as our history with chemistry shows.

The resources needed to achieve this goal are not insignificant, as indicated by a back of the envelope calculation:

**COSTS FOR HIRING 20 NEW SENIOR SCIENCE FACULTY**

1. Cost for one distinguished senior faculty member:

<table>
<thead>
<tr>
<th></th>
<th>Annual</th>
<th>One-Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty salary and benefits</td>
<td>$185K</td>
<td></td>
</tr>
<tr>
<td>Administrative support</td>
<td>$15K</td>
<td></td>
</tr>
<tr>
<td>Academic Support(^{16})</td>
<td>$35K</td>
<td></td>
</tr>
<tr>
<td>Space Costs(^{17})</td>
<td>$30K</td>
<td></td>
</tr>
<tr>
<td>Start-up-costs (one-time)</td>
<td></td>
<td>$750K</td>
</tr>
</tbody>
</table>

   Total Costs for 1 Faculty: $265K $750K

2. Costs for 20 distinguished faculty $5.3 M $15M

This calculation suggests that to make a major improvement in the sciences over a five-year hiring period, Arts and Sciences will need to increase its operating budget by about $5M and find $15M in one-time costs. The exact amount of resources will hinge on the nature of the science, of course; the overall target could be higher, depending on space costs. Thus, a more careful analysis of space needs (and turnover of faculty) is necessary. Although new indirect cost recoveries from grants and contracts could offset

\(^{16}\) This figure assumes two university-funded graduate stipends and incremental library support.

\(^{17}\) This figure is derived from LSRC data and assumes debt financing.
some of these annual costs, perhaps up to 25%, Duke does not now have the internal resources to invest at this level. Since it is unlikely that Arts and Sciences can increase the science budget by $5M without penalizing other important areas, new monies will need to be found. A $100M endowment is required to cover these operating costs. Therefore, major gifts in the Campaign will be critical to future success in the sciences.

While significant new resources will be needed to move the physical sciences to a higher plateau, the faculty also have a responsibility for bringing in more resources through sponsored research. Across the four core departments of the physical sciences (again, chemistry, math, physics and computer science), the average annual sponsored research income per tenure track faculty member is $195K\textsuperscript{18}, across all seven departments (also including BAA, botany and zoology) it is $173K. Based on data exchanged within a group of ten university provosts, our Arts and Sciences departments have room for improvement. A comparison with schools including Carnegie Mellon, Case Western Reserve, Vanderbilt, Washington University and Rochester reveals that Duke’s sponsored research per faculty member is below the mean of this group for the biological sciences and computer science, approximately at the mean in chemistry and math, and well above it in physics. Our performance against this peer group is only middling, and we want to set our sights higher. It would not be unreasonable to expect the Duke faculty to increase the sponsored dollars per faculty member short term to $250K-$300k per year, thus realizing at least $4.2M annually across the physical sciences. These monies would be used to enhance the strength in the physical sciences.

\textsuperscript{18} Based on 97/98 data, this figure includes both direct and indirect costs.
It is important to understand that sponsored research does not cover the core expenses of the faculty—that is, nine months of salary and normal support costs—but it does fund equipment, graduate students, post-docs, laboratory costs, and other expenses of doing research. This support is critical to the quality of the research and hence to the reputation of the department. Excluding mathematics, it is not unusual for departments to average between $300K and $500K per faculty member at the top schools. The Arts and Sciences dean and the provost, therefore, need to encourage the science faculty at Duke more strongly, and then reward their efforts: although many faculty are indeed bringing in large grants, and working very hard and productively, unfortunately many others are not doing so. In addition, as I have just stated, we must target a part of our Campaign to raising several gifts at the level of $10-20M to be earmarked for the sciences, not just for endowment but for actual expendable, programmatic money as well.

In recent years, Duke has made a number of appointments that were based on specific areas in which Duke has particular strengths or where a target of opportunity arose. Duke should encourage the department chairs and faculty to bring such opportunities forward. Several years ago we created a central fund for strategic initiatives in science and engineering, which helped support the transition of several programs into the LSRC and is now providing funds for our investment in cognitive neurosciences. I plan to set aside $5M from the science and engineering fund over the next five to seven years to help the schools with impact appointments in these fields.

While Duke could continue to make progress in this area of the sciences by an inward departmental focus, Duke will be far stronger if it defines areas of importance that overlap departments and schools. We have in fact done this well in a number of areas.
Examples of such interdisciplinary initiatives are the Center for Non-Linear and Complex Systems and the recent collaboration between physics and mathematics in the area of geometry and string theory, where appointments have been coordinated and have benefited both departments. (Another possible connection to build between math and physics is in astrophysics, since we have just recruited a tenured faculty member in mathematics with interests in this area.) As noted earlier, we are engaged in a similar effort now in the fields of cognitive neuroscience and brain imaging analysis—an effort involving faculty hiring in Arts and Sciences, Engineering, and the Medical Center. I also believe that we have an opportunity to advance significantly in geosciences as we continue to develop the Nicholas School.

Engineering\textsuperscript{19}

Engineering was one of the schools identified by Mr. Duke as part of his university. At the time of the indenture, Harvard and Stanford had engineering schools but Yale did not. Stanford's was newly established, and by 1930 had about 37 faculty and 290 undergraduates. In the '70s, Harvard’s Division of Engineering and Applied Physics undertook a change of focus to the sciences underlying modern engineering and adopted the name Division of Applied Science; more recently, education in engineering at Harvard was strengthened under the new dean and the name was again changed a few years ago, to the Division of Engineering and Applied Sciences. Yale now has a small but respectable engineering program, but it is not a national impact player, while Stanford, in contrast, has one of the best engineering schools in the country. In this regard, it is

\textsuperscript{19} Since we are searching for a successor to Earl Dowell, who has overseen significant growth in the size and quality of the Engineering School, I will go into more depth on my thoughts for the school's future.
important to realize that engineering programs exist in a different environment than most other schools, which presents a different challenge when one is trying to have not only a vibrant program but also an “impact” program. We must recognize that Duke’s engineering program also competes against universities that have an engineering/technology mission, such as MIT, Cal Tech, and Carnegie Mellon. In general these schools will have larger engineering departments and more resources than universities without a technological focus. In addition, many states believe that large, top-quality engineering schools help their economy and therefore they put far more resources into their state engineering schools than into other areas (the humanities, for example). The University of Illinois in Urbana-Champaign and Purdue have stellar engineering schools, and Duke must compete with them for faculty and research dollars, though we rarely compete with them for students at the undergraduate level.

Duke’s Engineering School is probably most similar to Princeton’s, which has five departments including electrical, mechanical, civil, and chemical engineering plus computer science. All of Princeton’s five departments are ranked in the top ten, and in selected areas have wielded significant influence, but Princeton would not be considered an impact player in the broad sense that Stanford and MIT are. Duke’s biomedical engineering department is ranked second by *U. S. News Reports* and fourth according to the NRC ratings; it is an impact player in its field.

It is interesting to observe that for the group with which we compare ourselves, including Stanford, Harvard, and Yale, there is a very large variation in the size of the
undergraduate engineering student body. At one end is Cornell, which graduates about 725 undergraduate majors in engineering per year. At the other end are Harvard with about 80 and Yale with about 50, with Stanford in the middle range at about 250 engineering majors annually. It is striking that when we include Duke computer science majors in this calculation, Duke with 230 graduates per year has almost the same number as Stanford. When we look to faculty size, however, we see that Stanford has 180 faculty in engineering compared to Duke’s 80 (which includes computer science). As noted, Stanford has one of the most prestigious engineering schools in the country and has historically been an impact player; Duke has a respectable engineering school but, except in biomedical engineering, is not a major player. The obvious difference between the two schools is that Stanford has more than double the number of “engineering” faculty as Duke. Even so, it produces the largest number of Ph.D.s per faculty member of any university and also graduates a sizeable number of masters’ students, who provide a large revenue stream for the institution.

Another important benchmark of an engineering school’s intellectual strength is the sponsored research raised annually through faculty efforts. Over the last ten years or so, Duke’s School of Engineering has been making marked gains in sponsored research funding, and since 1987/88 the sponsored research has actually increased from $3.0M to $13.1M, an average annual increase of 16.0%. While this rapid growth has been a very important marker of the school’s rise, Duke engineering is now ranked 25th based on total research dollars raised per year per faculty member (about $225,000 per year) in a cohort

20 Since most computer science departments are in engineering schools, the statistics include computer science baccalaureates whether or not the department actually falls under engineering.
of 44 private and public engineering schools. If the engineering school wants to move to a top ten position in departmental rankings, one objective should be to move the sponsored research to close to tenth place. Although sponsored research activity is not a perfect indicator of intellectual contributions—a theorist, for example, may make major contributions with a small group—generally much of the research in engineering requires large labs and a significant number of graduate students and post-docs to be highly productive.

If the faculty wanted to move to a number ten position on this measure, they would need to bring in about $350,000 per year. With 60 active research faculty, that increase per investigator would bring in about $7.5M annually to the school. About two thirds of this amount would support the direct costs of research, while the remaining one third would support indirect cost reimbursements, providing a more flexible income stream to the school. As noted above, in the most recent completed year, 1997/98, the school did exceed $250,000 in research funding per faculty member—the target set in the school’s strategic plan of a few years ago—and the signs are promising for continued growth in this area.

Duke would appear to have three alternatives with respect to the School of Engineering’s future. Duke could choose to:

(1) Aspire to be in the league with Stanford, i.e., keep the undergraduate population where it is, but dramatically increase the size of its faculty, the number of graduate students (both doctoral and master’s level), and the amount of sponsored research. This would also require extensive and expensive new facilities, though some of

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21 This information includes computer science for all universities.
the facilities costs would be covered by sponsored research. This alternative, if it were expected to occur over the next decade or so, would require very considerable new resources from the university.

(2) Follow its present course, i.e., keep the existing four departments. Three of the four departments range from excellent to respectable; one department, civil and environmental, is not as strong as it should be but has some promising junior faculty. Because of the increased faculty efforts and other changes, in the last year or so the Engineering School's financial situation has markedly improved, and it is now positioned to be able to increase the size of the faculty modestly. We must also recognize that the recently tenured faculty are quite good and are making strong contributions to their fields. From this perspective, following the present course is basically letting it be a "tub on its own bottom," with the possibility that some of the central resources will be available for specific initiatives.

(3) Reposition its directions—that is, take advantage of the strong departments, but redefine civil and environmental engineering. For example, we could consider phasing out civil engineering as we now know it and creating a department of environmental engineering with a broad mandate to embrace local, regional, and global environmental issues. To my knowledge, no engineering school has done this. Such an entity could have an impact on all undergraduate engineering departments with courses that focus on designing products or systems that are environmentally friendly. Faculty in the department would focus broadly on environmental issues—for example, on the development of new energy sources (wind, solar, biomass) that do not cause global warming. Clearly a strong argument for such an effort is the existence of the NSOE;
given the physical proximity between the two schools, strong collaboration should be possible.

In my opinion, the two alternatives that are feasible are two and three. At this time I cannot recommend that the university put in the resources to follow the Stanford model. In suggesting alternatives two or three I am basically urging that we continue to follow the Princeton model, i.e., on the order of four departments of a size to make a significant impact in a small number of areas. The strategy should be to continue to grow the faculty and the graduate programs but to keep the undergraduate program at its present size. In fact, this has been Dean Dowell's approach. However, I think Duke and the School of Engineering should seriously look at repositioning themselves. Over the near term we should make a major effort to increase the size and quality of the departments of electrical and computer engineering and mechanical engineering and material sciences while maintaining the strength of biomedical engineering. Strong arguments exist for significant changes in our thinking about civil and environmental engineering, and the next provost and dean of Engineering should give special attention to this area.

It should also be noticed that there are a number of collaborative efforts between Engineering and the rest of the university, the most prominent of which are in biomedical engineering, with its strong ties to the Medical School to the advantage of both. In a large number of universities—among them, Stanford, Cornell, and Princeton—computer science is in the engineering school, a model that might be a good one for Duke in the long run, but would not be feasible until Engineering is stronger. Finally, the School of Engineering needs to pay more attention to the cutting edge areas in engineering that will
have a wide and lasting impact, and be careful not to become too involved with finding niches, particularly if they are narrowly application-oriented. This does not mean there should not be applied work, but rather that a balance should be struck between theory and fundamental breakthroughs and applications. Right now, certain departments are too niche oriented in my estimation.

My recommendation for engineering is similar to that for the physical sciences: over the next five to ten years, increase the size of the school by something on the order of 20 positions, with most of these positions in the fields of electrical and computer engineering and mechanical and materials science. The cost would be similar to the proposed increase in the physical sciences, requiring about $5M annually and $15M in start-up costs. An endowment of $100M would support this program, and clearly a number of major gifts are needed. As in the case of the physical sciences, a major benefit of such gifts is the impact they will have on attracting stellar faculty, who will know that Duke is serious about increasing the quality of these departments.

**Information Technology**

The final topic in the broad area of physical sciences and engineering is Duke’s strategy with respect to information technology. Historically, Duke took a decentralized approach in this area. In our SACS accreditation self-study of a decade ago, we acknowledged that “as a major private institution for instruction and research, Duke University is behind the times with regard to campus-wide use of information technology. The University has yet to make a strong institutional commitment to modernizing and networking its computing resources.”22 When President Keohane

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22 *Crossing Boundaries*, p.121
arrived on campus five years later, in 1993, one of her surprises was that the Allen
Building had sub-standard wiring and few, if any, administrators used e-mail. Duke was
probably ten years behind its peer institutions. This does not mean there were no IT
efforts on campus at the time, but rather that each school was responsible for its own IT
needs, and there was little coordination. Duke did, and still does, have access to super
computers thanks to the Research Triangle Park and MCNC. One of the president’s first
actions was to initiate a search for a vice provost for information technology, and Betty
Leydon was on board by the fall of 1994.

Since that time Duke has made enormous strides in this area, and we are into the
fourth year of a $10M project (including wiring and electronics) to complete the wiring
of the entire campus in 1999. Two additional major IT projects are underway at the
present time, with resource commitments on the order of $35M. The first, “Project
Enterprise,” will replace core financial and human resources systems, beginning with the
health system, with powerful new client-server technology provided by SAP. The
estimated cost of the first phase of this major effort is $30M. Under the aegis of the
Student Information Services and Systems (SISS) project, we are also replacing the core
systems that support admissions, financial aid, student records and student accounts
throughout the university. The PeopleSoft Student Administration System provides the
software, and the estimated cost of this project is $5M. These investments in our network
infrastructure and core administrative systems will bring us to a “state of the art” position
in these areas.

Our progress in information technology, in fact, has resulted in national
recognition on several fronts. Duke was recently selected by our peers as the winner of
the 1998 Excellence in Campus Networking Award from the premier national information technology organization for higher education institutions. Several additional honors over the past three years include the cover-page article in PC Week for Project Dunk, a self-help database that enables computer users to find solutions to problems on their own, and the 1998 User Services Excellence Award from Network World for our assistance to new and returning students. We may be playing catch up with these infrastructure needs, but I am happy to report that we are at least in the game now.

The major remaining area in IT is its integration into the academic sphere, including having all faculty and students comfortable and proficient with those technologies they find useful to their activities. At the student level, both for undergraduate and graduate students, Duke needs to set as its standard that all students are proficient with e-mail, the internet, word processing and spreadsheets; it is reasonable for every instructor to assume the students have these skills, and some units do already require students to own and use computers. Our most recent SACS reaccreditation audit, however, found Duke deficient in demonstrating that our Arts and Sciences undergraduates do have these competencies, and we are taking steps to come into compliance with our evaluators’ recommendation.

With respect to faculty, we should be providing an infrastructure enabling faculty to learn and use IT, to the degree that they deem it effective and important to their scholarship and teaching. For some schools, such as Engineering, Fuqua, the Medical School, and Law, a high level of proficiency is required of most, if not all, of their faculty. In Arts and Sciences there is a wider spread of interest and proficiency. While I believe every faculty member has the right to decide how he or she wants to use IT, Duke
should have multiple support mechanisms for interested faculty. In order to create such an environment, David Ferriero has the responsibility for building a center that supports the faculty in the use of IT in and out of the classroom. Lynn O’Brien has just assumed the position of director of instructional technology—she comes to Duke from Brown University, where she did an excellent job in a similar role.
IV. UNDERGRADUATE EDUCATION

As noted in the Introduction to this document, James Buchanan Duke envisioned undergraduate education as a key component of this university and emphasized the importance of retaining Trinity College as its core. Since that time the undergraduate program has grown in quality, and the trustees, faculty, students, parents and friends are justifiably proud of its recent high rankings in the *U.S. New and World Report* rating system (3rd in 1997 and now tied for 6th). Undeniably, over the last three decades Duke has gone from being a southern regional university to a national and increasingly international university. Neither Duke nor any other southern university could become a national university until segregation ended and students of any background—ethnic, religious, economic—could be admitted (a point to which I shall later return).

While it is tempting to believe that these rankings are accurate, I—and many others—have doubts. The more important question is whether our undergraduate education is as good as it can and should be. I do not believe it is, even though there is evidence (student satisfaction levels, for example—see Table 9.) that the trajectory is strongly positive. Admittedly, it is difficult to get good data about our own institution, let alone comparative data from other universities. When I talk with colleagues, we have wide differences about what other schools do well or not so well. Yet on several scores Duke is not where I would like to see it, including the students we matriculate. Although one could argue that “yield” per se is not a measure of the quality of the education we deliver, a major factor in the student’s decision to come to Duke is certainly his or her perception of the quality of the undergraduate education. That our yield is far lower than many of our competitors’ yields may reflect poorly on the perception of Duke. Of course
we are dealing here with the proverbial vicious circle, because the quality of the
education is also heavily dependent on the quality of the students in the classroom and
residence halls, since much education results from interactions with peers.

In any case, the subset of recent *U. S. News* rankings that is based on combined
measures of student selectivity and "quality" (that is, percentage accepted; percentage in
the top 10% of class; median SAT) places Duke only about 12th in the list of U. S. private
universities. Duke's rank in faculty quality, as perceived by peers, is similar (not too far,
in fact, from the NRC ranking data on faculty quality). Harvard, Yale, Princeton,
Stanford, MIT, and Cal Tech clearly rank above Duke in student selectivity/quality and
faculty quality; Columbia is slightly ahead of Duke on both. Schools such as Dartmouth,
Brown, and Rice seem to be more selective for students than Duke, while Cornell,
Hopkins, and Chicago probably have more highly regarded faculty. Penn is roughly
comparable to Duke on both counts.

If we look in particular at the major yardstick of value added to a student's
intellectual profile while at Duke, here is where I feel we may fall most short. I
recognize that this is a complicated problem, but we do have some data (Table 8.)
indicating that Duke falls short in student perceptions of the enhancement of writing and
foreign language skills, as well as understanding of culture, history, and diversity, when
compared to other universities. On the positive side, over the last few years, due to
converging interests in the provost's office and the Arts and Sciences dean's office, a
number of steps have been taken to address the present state of affairs, and there is
evidence of change.
Let us start the discussion with the good news. First, the Class of 2002 is the academically strongest and most diverse class that Duke has ever admitted. The only aspects of the entering class not in line with where the president and I would like us to be are the matriculation of more (and more diverse) international students and of a higher percentage of Hispanic and Asian students. This is largely a resource question, given financial aid concerns, and we hope that the campaign will let us make some major strides in these areas. However, in this last year a number of universities have committed to richer financial aid packages, which will be a challenge for Duke to match.

Second, it is true that a number of departments are very dedicated to undergraduate teaching and do a superb job: four that immediately come to mind are political science, philosophy, public policy studies, and the literature program, though I know there are many others as well. Moreover, some of our most productive and well-known scholars are truly dedicated to the teaching and mentoring of students on both the undergraduate and graduate levels.

Third, in Arts and Sciences, Dean Bill Chafe really cares about undergraduate education and has taken significant steps to improve it. He appointed two deans, Robert Thompson and Jim Siedow, who share his convictions about the importance of undergraduate education, and charged a new committee with a thorough review of the current curriculum.

Fourth, the two-tier tuition increase will permit Trinity to address a number of priorities, in particular the teaching of foreign languages, the opportunities for capstone experiences (individual research and senior seminars), and the funding of the first-year Focus Program, including increasing the number of students participating in the program.
In addition, the two-tier increase is the predominant funding source for Trinity College's plan to appoint 30 new faculty, and therefore to increase the number of courses offered and decrease the class sizes, which should also improve undergraduate education.

Fifth, as alluded to above, during the last year a major review of the undergraduate curriculum and requirements has been undertaken and was presented to the faculty in the fall. Based on the presentations and supporting material, I believe that the proposed new curriculum, if adopted this month, will substantially strengthen the intellectual quality and rigor of the undergraduate degree. For example, a decade ago all students had to demonstrate some proficiency in a foreign language in order to graduate; this requirement was dropped in 1988, and the data clearly show that there was a large drop in the number of students taking foreign languages at that juncture. The result of this drop is revealed in Table 8: fewer than 40% of our recent seniors indicated that their foreign language abilities were enhanced by their Duke education, a lower percentage than at the other institutions surveyed. As our world gets "more global," I believe that one benchmark of a strong liberal arts degree is competency in a second language, as the new curriculum proposes. The data also show that the percentage of students taking courses in science, math, and quantitative reasoning dropped with the change in curriculum requirements in '88, and the new curriculum addresses that issue as well. The adoption of this new curriculum is, in my view, the most important step that Duke can make if it wants to claim it is one of the best universities in terms of the quality of undergraduate education.

Sixth, the Focus Program for first-year students has been recognized nationally as an innovative program that ensures close contact between the students and the regular
faculty in small seminar classes. About a quarter of the undergraduates now enjoy this experience.

Seventh, the all-freshman East Campus provides a better intellectual environment for first-year students, where students can interact easily with others in their classes, eat (some might even dine) in a central location, have dorm classes, and not be distracted by the often noisy background on Main West. This experience has been so positive that students have high expectations when they move into their sophomore year, expectations that at present we have difficulty meeting. A residential planning group of which I was a part this past summer has now released recommendations concerning the enhancement of upperclass residential life, including strategies for creating carryover from first year experiences. We continue to make progress on this front, with a creative architect who is presenting possibilities for better use of our current housing facilities.

Eighth, our merit scholarship programs—particularly the A.B. Duke program—do bring to campus some of the best minds in the country, as seen by our recent success with Rhodes Scholars. The presence of such students enhances the Duke experience of many other students (and faculty). The new University Scholars program should add to that luster.

Given the positives, what is the evidence that Duke is not providing the education the students deserve and should and could have. First, we will look at data comparing Duke to other schools, and then turn to other issues specific to Duke, some of which are clearly factual and some of which derive from my observation.

There are a number of indicators that allow us to conjecture how Duke is regarded compared to other schools:
**Overall yield.** "Yield" is the percentage of applicants offered admission who choose to matriculate. It is an important competitive measure and a strong indicator of quality as perceived by parents and students. Duke's yield rate has consistently been in the lower 40s over the last decade, with a yield of 44% for 1988/89 and 43% in 1998/99. We have generally regarded the slight decline over this period as a corollary of the increasing quality of our applicant pool, since many of these students have very attractive alternative offers of admission. Table 6 in the appendix, providing a thirteen-year history of undergraduate yield rates at several universities, shows that the institutions with the highest yield rates are consistently Harvard (76% in 1997), Princeton (66%), Stanford (64%) and Yale (61%). In fact, only three schools had a significant change over this period, Princeton's for the better and Chicago's and Rochester's for the worse. Over the last five years or so, Brown, Columbia, Dartmouth, Georgetown, MIT and Penn have all also had yield rates consistently higher than Duke's, which ranks 13th among these 18 private elite universities.

**Head-to-Head Yield Rate.** Admitted students are asked to provide information on the other schools to which they were accepted when they reply to our offer of admission. Their responses allow us to study our yield rate for students admitted to Duke and each of the other major private institutions. Table 7 indicates that if a student is admitted to Duke and Harvard, Yale, Stanford, or Princeton, the likelihood that he or she will choose Duke ranges typically from 10% to 25%. These relationships have been consistent throughout the 1990s and probably before as well. For students admitted to Brown, Dartmouth, Columbia, and Penn, the odds that they will choose Duke typically range from 40% to 60%, with Duke losing more often to Brown and Dartmouth and less
often to Columbia and Penn. Although there are year to year fluctuations in this pattern—this year, for example, Duke won over Dartmouth and did better than usual against Penn—these relationships appear to be fairly stable. Students choosing between Duke and Cornell, Georgetown or Northwestern, are consistently more likely to choose Duke, with percentages in the 60% to 80% range.

**Overall Satisfaction Responses to Senior and Parent Surveys.** Tables 8 and 9 in the appendix are based on senior surveys of overall satisfaction. While Duke students seem to be very satisfied with their overall education—more so even than students at the other prestigious schools participating in the 1998 survey: Stanford, Harvard, Princeton, and Yale, as well as Brown, Columbia, Cornell, and Dartmouth—they are less likely to recommend their university to a high school senior. The especially disappointing discrepancy between these indices on last year’s (1997) survey may reflect dissatisfaction on the part of some recent graduates about changes in residential life related to the all freshman East Campus and university alcohol distribution policy. (Note the unusually poor showing for Duke on “administrative responsiveness” in the survey results.) We are tracking these results carefully, and it was encouraging to see a more positive correlation between satisfaction with Duke and willingness to recommend the institution in the 1998 survey, although we are still below the other eight schools.

With parents we fare better. In a recent comparative survey of parents, satisfaction with Duke was very high, consistent with that of parents of children attending a very strong group of peer institutions. As the following table shows, Duke parents’ responses compare well with responses aggregated from parents of students attending Harvard, MIT, Princeton and Yale (designated “HYMP” in the table), and even better with
responses from other survey participants (Columbia, Cornell, Georgetown, Johns Hopkins, Rice, Chicago, and Rochester), in terms of both the academic and residential components of our program. In the table, the numerical score represents the average response on a scale of 1 (poor) to 5 (excellent).

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<tr>
<th></th>
<th>Duke</th>
<th>HYMP</th>
<th>Other</th>
</tr>
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<tbody>
<tr>
<td>Quality of teaching</td>
<td>4.4</td>
<td>4.5</td>
<td>4.3</td>
</tr>
<tr>
<td>Students' access to faculty</td>
<td>4.2</td>
<td>4.1</td>
<td>3.9</td>
</tr>
<tr>
<td>Academic qualifications of students</td>
<td>4.8</td>
<td>4.8</td>
<td>4.5</td>
</tr>
<tr>
<td>Emphasis on undergraduate education</td>
<td>4.4</td>
<td>4.3</td>
<td>4.2</td>
</tr>
<tr>
<td>Intellectual atmosphere outside classroom</td>
<td>4.1</td>
<td>4.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Residential facilities</td>
<td>3.5</td>
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<td>3.3</td>
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**Student Evaluations.** Another quantitative measure of the strength of the undergraduate experience should be based on student evaluations of the faculty. Some of the schools at Duke do this quite well—for example, Fuqua and Law. In the case of Arts and Sciences and Engineering, this process has been weak, though there are ongoing efforts to address this problem. At the present we simply do not have good data on the quality of our undergraduate instruction. One might argue that just because we do not analyze the data does not mean the faculty do not teach as well as faculty at institutions where the process is more thorough. However, the fact that Duke has not scrutinized its teaching information strongly suggests that we are not paying sufficient attention to teaching. It seems reasonable to assume, in addition, that comparative data keep the faculty on their toes.

Most universities of which I am aware have developed fairly sophisticated methods for student evaluations of teaching that allow comparisons of faculty members' performance within the department, within the school, and across schools. Stanford had
this practice forty years ago. I am more than ever convinced of the necessity for gathering useful data that can help us to improve our teaching and learning at Duke. The good news is that it appears we are making progress on this front. Dean Chafe has agreed that from now on, all departments will compute averages for all faculty in order to provide a basis for comparative information.

Two years ago I charged a faculty-student committee to look at this issue in response to students' unhappiness with what they saw as disregard of good teaching in a tenure decision. The committee endorsed the importance of student evaluation of courses and instructors and pointed out the need for comparative data. We are in the midst of developing a system that will use the WEB to collect and analyze the data, thanks in great part to a member of Duke's faculty who is devoting considerable time to its design and implementation. The first pilot study was done this summer, and because we are using the WEB, we have the opportunity to collect much more information; as a result, we will not only evaluate the instructor more effectively but also gain other information about a student and his or her opinion of other issues at the same time. It appears that Duke has the opportunity to advance quickly from one of the weakest faculty and student evaluation systems to one of the best. However, this system will have to be approved by a faculty committee before implementation, and I know some faculty are not in favor of it. Without a robust system to evaluate faculty teaching, it is hard for me to argue that Duke is special in its attention to teaching.

**Who Teaches Our Students.** Acknowledging that many students choose a college or university based on factors having little to do with the academic experience, I believe that for those who are really interested in the quality of academics, one of their
most salient decisions is between the small elite college and the research university. Clearly, both paths have produced graduates who become national and world leaders in all fields, from academics to business and politics, but by different routes. The strengths of a liberal arts college lie in the small classes, the quality of the faculty, and the attention paid by faculty to their students. Most of these faculty are active scholars, but rarely as productive as faculty at research universities. In general, the liberal arts colleges have a higher percentage of their students going on to graduate school and earning the doctorate than research universities.

The theoretical advantage of a research university for an undergraduate is the opportunity to be taught by some of the world’s greatest minds, and, in some cases, to do research under them. What many consider a downside is that graduate students will teach a certain percentage of the courses. In the 1950s at Stanford, that was also the paradigm: I had three writing courses and two history courses taught by graduate students. Though they were good instructors, I was most struck by the fact that Nobel Laureates taught my four physics courses, and three of the four were outstanding teachers. More than 75% of my courses overall were taught by the regular tenured or tenure-track faculty.

At Duke, professional school students as a rule undertake a greater percentage of their coursework with regular rank faculty than do Arts and Sciences students and those in the NSOE. In the category “regular rank” I include tenured or tenure track faculty, the faculty whom we feature as our best, as well as professors of the practice and/or research professors—whom we hire after a national search and review regularly. The latter are usually excellent teachers, with multiple-year contracts, but are not eligible for tenure. The mandatory University Writing Course and the many lower level language courses
undertaken by our undergraduates are typically taught by non-regular rank instructors and therefore greatly affect the percentages in Arts and Sciences.

While graduate students teach 14% of the Arts and Sciences courses, the relatively smaller size of their classes means that graduate students teach only 11% of the average student’s courses. A major benefit to the use of graduate students (plus adjuncts and visiting instructors) is that our average class size in the humanities is small and our course offerings very diverse. Judging by course evaluations, the instruction by graduate students is by and large of high quality. Indeed, my remarks about the preferability of a higher amount of regular faculty instruction should not be misconstrued as a denigration of the teaching efforts of graduate students. Rather, I advocate a more consistent and prominent classroom exposure of our undergraduates to our highly-regarded faculty as well as a reconceptualization of additional ways for Duke to tap into the unique and valuable qualities of its graduate students. It should be noted that under our present rules, all of these graduate students must go through some teacher training, and Arts and Sciences is increasing the standards for this training. The recent SACS self study on “balancing the roles of the research university” remarked on the uneven quality and extent of the training, recommending that every doctoral program take careful stock of its current classroom uses of graduate students and reassess its teacher training goals (a subject I address further in the following section). I will return to this issue in Section V., on the Graduate School.

I would add that we need to assure ourselves that the additional non-regular rank faculty who teach our undergraduates are also assisted and monitored. At least some of this group are holders of the doctorate with administrative appointments, whose teaching
may be equivalent to that of the regular rank non-tenure track faculty. Our recent review by the Southern Association recommended that we keep better tabs on the expectations and performance of all part-time faculty—our adjuncts and visitors—and the deans have agreed to do so.

While I noted earlier that Duke has some highly ranked departments, based on the NRC data, which also are very devoted to undergraduate education, other departments that are highly ranked provide less robust instruction. I am not talking about expecting every faculty member to follow the same path: some have heavy commitments to graduate students and/or departmental responsibilities, and during those periods they may not teach undergraduates. However, we have an obvious need to build a collective sense of a teaching mission and curriculum in every department. Recruitment, that first stage in the conveying of a university’s culture, initiates the problem if too many in a department come to Duke with an expectation of little or no teaching or service. The problem is complicated by the fact that, too often, particularly when another school is courting one of our faculty, part of the bargaining is for a lighter teaching load. While the dean tries to hold the line, having higher teaching loads or less frequent sabbaticals than a competitor confounds building a strong faculty. I was pleased to hear Bill Chafe, in his address to the Arts and Sciences Council last fall, articulate a clear expectation of strong undergraduate teaching on the part of all faculty.

**The undergraduate writing experience.** One could argue that writing well is one of the most important skills for any student. Here we are not doing a good enough job, particularly with the first year writing requirement. Again, the dean is trying to rectify the situation (and Duke has had many iterations of UWC over recent years) but it
is still a major problem. My personal opinion is that Duke has not picked up on approaches that have been in existence for at least 40 years at other universities, i.e., we do not test the students before classes begin to determine their writing proficiency. Many freshmen have had excellent instruction in secondary school, while others have been at a high school that was very weak. Many universities have a writing test before classes start and typically 50% of the students test out of the first course. My experience at two universities that do testing is that the students are much happier with the writing program; additionally, such a step would save money and decrease the number of courses taught by graduate students (who often find this kind of course problematic on several counts). I would point out as well that one of the initiatives under the two-tier tuition increase is to create a teaching and learning center that will include a strong writing component. Such a center is common at other universities. Although the Academic Skills Center on this campus has long helped our students with writing, we need a unit more focused on this area and staffed with experts in the field. The senior survey (Table 8.) indicates that although about 75% of our graduates believe that their writing abilities have been enhanced at Duke, we lag behind the other institutions surveyed on this measure.

**Academic integrity at Duke.** Another area in which we seem to be behind our peers is in having a functional honor code. Duke adopted an undergraduate honor code in 1993, whereas some schools have had honor codes since their founding. However, Duke’s honor code has two major weaknesses, which, by my standards, means we do not have a fully functioning code. First, to me, an honor code means the faculty believes in the academic integrity of the students and expects that they will not cheat; in such a system, exams are not proctored. This is not now the practice at Duke.
Second, I question the standard penalty at Duke for violating the honor code in a significant way, for example by plagiarism: suspension for two semesters, often including the summer. At some universities, a student may be permanently expelled for major infractions. At others, after a single infraction the student may not return for one or two years. I would hope that in cases of serious cheating, students would be separated for at least one full academic year. Clearly there is a wide range of possible policies on academic integrity, but such policies do reflect—and reflect on—an institution's character and principles. With the assistance of the Kenan Ethics Program, the Center for Academic Integrity, and the Honor Council, a reinvigorated discussion of these issues has gotten underway. The faculty and administration need to be much more closely involved in framing and participating in the debate, and I would hope that we can make good progress this year in examining closely our current practices with an eye toward making changes.

In summary, the intellectual experience at Duke for an undergraduate is a "mixed bag." Many of our students get an excellent education at Duke, are stretched intellectually, and leave with substantive added value. However, too many do not. Though it is tricky—and rare—to be both a great undergraduate institution and a great research university, I believe that Duke can be both. However, attaining this end will require great effort and stewardship.

It is time to engage in a discussion, including the Board of Trustees, in the meaning of "value added" to our undergraduates' life as a result of undertaking the Duke educational experience. It is my recommendation that the deans of Arts and Sciences,
Engineering, and NSOE provide to the provost, and through the provost to the trustees, an annual report on the quality of the undergraduate experience their schools provide.

The Board hears regularly about residential life issues and admissions office statistics. I suggest it is time for the Board to have annual, in-depth reports and discussions on outcomes of academic life at this university.
V. THE GRADUATE SCHOOL

In September of 1997, Dean Lewis Siegel spoke compellingly to the Board of Trustees about the fundamental role of the Graduate School in fulfilling the overall mission of Duke as a research university. In terms of both its programs and its students, the Graduate School plays a key role in enhancing the reputation of the institution. Because of the broad scope of its activities, which involve nearly all of the schools at Duke, the dean of the Graduate School, in his associated role as vice provost, has been given the significant responsibility of overseeing the process of systematic external review of Duke’s academic programs. By mandate of the faculty, the dean also serves as an advocate for scholarly excellence throughout the university in the appointment, promotion, and tenure process. By reaching across departments and schools, the Graduate School is grounded in the principle of interdisciplinarity, an important university initiative; indeed, the type of programs most recently approved by the Graduate School—in East Asian Studies, Latin American Cultural Studies, Nonlinear and Complex Systems, Cellular and Biosurface Engineering, Molecular Cancer Biology—point up how cutting edge Duke can be when faculty are encouraged by to think and act beyond boundaries in terms of both education and scholarship.

I have already referred several times to the most recent NRC rankings that place nearly half of all our graduate programs in the top twenty in the country, and several in the top five. The strengthening of Duke’s faculty ranks in the 1980s paid off in applications from better graduate students, and in combination with the downsizing of graduate programs in recent years has enhanced the quality of our graduate students. As an example, we increasingly require prior evidence of research experience at the
undergraduate level before an application is accepted. The selectivity rate has improved dramatically: just over 20% of applicants are now admitted, compared to over 40% 15 years ago. GRE scores have risen about 70 points in the same period, and the median is now well above 1300. More of our students are finishing than ever before. Our Ph.D. program attrition rates have been reduced dramatically in recent years, due to better financial support for students in their early years of study. In addition, the time to the Ph.D. degree at Duke is much shorter than the national average in virtually every discipline. In terms of post-graduation positions, our doctoral students are being well placed in academic careers in an era when many institutions cannot make that claim, and an increasing number of our graduates are entering, and making their marks in, a wide variety of other careers that make good use of the specialized training we can provide at Duke. All these markers tell us that our graduate students represent a resource whose contribution to the institution and beyond is in its own way as significant as that of our faculty and undergraduates.

While they are with us at Duke, graduate students help us attract the best faculty and also make significant contributions to the education of undergraduates. Thus, they are a kind of “sandwich generation,” close enough in age to relate well to the 18-22 year old set, and so enthusiastic about their research that they generally translate ideas effectively in the classroom, yet advanced enough in their studies to be partners with the faculty in the intellectual enterprise. President Keohane has called them the “gateways of the modern research university,” representing “the vital links between cutting edge research and the foundational levels of undergraduate instruction”—able to challenge faculty and freshman alike. It is the particular nature of doctoral students that in whatever they
do—whether it is research or pedagogy—they try to work at the frontiers of their discipline; they find the cutting edge, and sharpen it. Wonderful resources as they are, our graduate students are sometimes taken for granted or even denigrated as signs of an inferior educational experience for undergraduates. We must resist and actively rebut both misguided attitudes.

As mentioned in the previous section, our recent SACS self-study highlighted graduate education and spoke eloquently for the need for a more effective utilization of graduate students in the classroom. The review team headed by Casteen from Virginia and Kennedy from Stanford took special note of this emphasis, remarking in its final report that “the boldest part of the [self study], we thought, was the vision that Duke can become at once a great center for undergraduate instruction and for the building of strong graduate programs with innovative design. These are interlocked objectives....” Rather than apologizing that graduate student instructors are a “weak link” in the undergraduate experience, the self study and Duke’s president took the “bold” stance that “graduate student teaching should be claimed as an asset to the institution’s instructional programs.” Kennedy et al. noted that Duke is not quite where it should be yet in fully delivering on this claim, but that the elements are clearly present at Duke to make this happen.

Specifically, the self-study found that teacher-training programs varied in quality from department to department and recommended that more attention be paid to producing uniformly substantive teaching experiences for all students who want them. Such experience will not only improve the undergraduate classroom as it enhances the skills of the graduate instructors, but it will also provide credentials that are increasingly
necessary for securing today's academic positions. I think it is important for the Graduate School to take the lead in ensuring that doctoral students in all programs have access to a range of pedagogical training and teaching experiences. This need is particularly important for graduate students in Arts and Sciences, Engineering, and the School of the Environment, in order to ensure the highest quality of instruction for our own undergraduate curriculum. It is also important, of course, for all programs in which we are trying to prepare for the next generation of academicians. But the ability to marshal, summarize, and clearly present knowledge to a general audience is an instructional skill that I believe is critical for all doctoral students, whether their career trajectories are the academy or business and industry. Duke should be bold in arguing that such training is a natural and necessary component of any and all doctoral programs.

A number of mechanisms might be available to the Graduate School in support of this broad mission. One would be to require (as suggested in the current "Guidelines for the Professional Development of Graduate Teaching Assistants" mandated by the recent SACS review) individual graduate programs to articulate the educational rationale behind the kinds of teaching assignments given to graduate students. The Graduate School, in conjunction with Trinity College, has already worked with some departments—English would be a good example—to reconceptualize the sequencing of these assignments in order to ensure both a variety of teaching experiences for graduate students and a reasonable demand in terms of hourly work load throughout the academic year. The important goal here is to think of instructional training and experience holistically, over the entire course of a graduate student's career at Duke. That is, we should focus on structuring the teaching experiences in such a way as to provide logical transitions from
initial pedagogical training (in specific coursework or in mentoring relations with senior faculty) through varieties of freshman instruction (such as the university writing course and laboratory assistantships) to upper level, capstone, or even advanced seminars for majors more along the lines of the named instructorship program.

With respect to the roles of graduate students as instructors, it must be noted that the experience of graduate teaching assistants in the university writing course has been particularly problematic for several reasons, among them the number of hours devoted to the task. As Arts and Sciences seeks to restructure its writing program and creates a Center for Teaching, Learning, and Writing, the place of graduate students in the writing initiative must be reconceptualized. Indeed, as the new undergraduate curriculum is devised and fine-tuned, the roles of graduate students in the undergraduate educational enterprise should be actively taken into account.

A second mechanism in support of teacher training, which is only just beginning at Duke, but for which we also see broad student and faculty interest, concerns development of teaching certification programs. At this moment, two departments—political science and physics—have formally approved creation of such certification procedures within their own graduate programs. Three other programs—biology (botany and zoology), mathematics, and English (through the university writing program)—are currently considering certificate tracks. The Graduate School has been, and should continue to be, an open advocate for these programs, perhaps even moving towards a formal Graduate School teaching certification program, which could provide effective collaboration between the efforts of individual programs and departments and the kinds of centralized pedagogical offerings that could be made available through the
new Center for Teaching, Learning and Writing. Were such programs to be developed, they would require effective interactions between what are, even now, far too separate departmental offices—that of the director of graduate studies and the director of undergraduate studies.

A third mechanism would be to make better use of those members of the graduate faculty who have already demonstrated their commitment to excellence in teaching and to the full professional development of their own graduate students. This would mean, perhaps, a renewed and concerted focus on the responsibility of graduate mentors to make sure that their students are receiving the kinds of professional and academic training and support necessary to prepare them for a broad range of employment opportunities. It means as well that there must be full and accurate tracking of Ph.D. placements and candid assessment of what our placements reveal about likely career trajectories. I am pleased to note that, in addition to its efforts to get Duke’s faculty to focus on placement issues for our new Ph.D.s, the Graduate School is beginning to encourage departments to develop real-world internships that can lead to rewarding non-academic careers for our graduates, and has initiated a series of discipline-specific workshops to introduce students (and faculty) to the wide range of career possibilities.

Besides career training, we must provide our Ph.D. students with appropriate, competitive funding. Ph.D. education—while shorter at Duke than at most other institutions—still averages about six years in most disciplines; in addition, career starting salaries, especially in the humanities, do not permit the ready pay back of a large loan burden. Any institution that does not offer competitive financial aid packages—which include aid for tuition and cost of living—will not compete effectively for the best
applicants. Under Dean Siegel's leadership, the Graduate School has been engaged in a program that includes both small increases in budgeted university resources and significant reductions in the student population in many of our Ph.D. programs; the goal is to make the financial aid packages that Duke can offer competitive with those offered by the major private research universities to which our best applicants are also normally accepted. When we began this program in 1994/95, the stipends Duke was able to offer put it squarely at or near the bottom of the group of 14 private universities with which we can compete. By 1999/00, largely as a result of the downsizing, Duke’s offers in most fields should be at the median of those institutions. In addition, Duke’s limited endowment for graduate study permits it to make a small number of better offers, largely in the form of James B. Duke fellowships, to try to attract the top 10% of the applicant pool.

Unfortunately, as of now, the budget of the Graduate School has permitted it to get to this point only at the expense of heavy subsidization from institutional resources that should be going to other programs at the University. Important programs for the quality and diversity of the Graduate School—which is, after all, Duke’s contribution toward preparing the pool of future faculty of excellence for the nation—are seriously underfunded. While Duke, on the books of the University, makes a substantial contribution toward the support of its graduate students from its regular budget, most of that contribution is in effect in the form of tuition reduction. Most of the funding for graduate student living costs (i.e., stipends) comes directly or indirectly from external grants and contracts in the case of the sciences and engineering, and from teaching assistantships in the undergraduate classrooms. Graduate students give a great deal of
service to the university and its faculty in return for this financial support.

Unfortunately, unlike the situation in many of the institutions with which Duke competes, too little of the funds available for graduate student support come from masters income and far too little derives from endowment.

At this time, the Graduate School is not in a position of financial equilibrium with respect to the funding of its Ph.D. programs in Arts and Sciences—even after a downsizing of the Ph.D. population in those programs of nearly 25% since 1992 and a substantial increase in the amount of external funding Duke’s faculty are raising to support graduate students. The process of downsizing, as conducted in cooperation with the graduate faculty, has tried to be selective and based on rational factors. As shown in a report prepared by President Keohane to an AAU Task Force on Graduate Education, Duke has in fact led the way nationally in moving away from basing the size of graduate programs primarily on institutional needs—such as the need for large numbers of teaching assistants in a particular discipline or for students to serve as low-cost assistants on faculty externally funded research projects—rather than on the needs for highly quality graduate education itself. The process of downsizing, while seeking to achieve competitive levels of financial support per student, has resulted in substantial reduction in the size of some of our best Ph.D. programs—for example, those in English, religion, history, political science—to a level that now may endanger our ability to attract and retain the type of faculty that we want at Duke: an intellectually vigorous faculty that expects and demands the intellectual stimulation that comes from interaction with bright doctoral students.
In many disciplines there are two Ph.D. students at most per faculty member, significantly below the numbers at most of our competitor institutions. Certainly we do not wish to lose faculty because of the scarcity of students with whom they can share the excitement of a lively intellectual community. I fully support the idea that several factors must be in balance as we determine the optimum numbers of students in a given graduate program: the intellectual justification for the program; the availability of faculty to train, supervise and mentor graduate students; the size and quality of the applicant pool; the ability to place our doctorates; and the availability of financial resources—both internal and external—to support the program. Increasing graduate student numbers solely for the sake of having them available to serve as teaching assistants or laboratory helpers is not a good reason. I believe, as well, that Duke must bite the bullet in graduate education, as in other areas, and eliminate graduate programs that are deficient in any of the aforementioned factors. The Graduate School has already suspended admission into the Ph.D. program in Slavics, due to an insufficient number of faculty and a low applicant pool. Using information derived from external reviews, it has also reduced the number of subfields in which Ph.D. training will be offered in programs such as religion and music. Surely there are other programs that merit this kind of inspection and decisive action by the Graduate School. Duke can and must achieve excellence in whatever it does with respect to graduate training; but it cannot—and need not—train in all areas.

As I stated earlier, I believe that we need to provide structures for teaching that are compatible with the need for graduate students to develop their own teaching skills and simultaneously complete the demanding course of graduate study that leads to a high quality doctoral dissertation. If Duke is to do this properly, there will surely be a
financial cost. No longer will we be able to have graduate students teach multiple sections of skills courses in a given year, and repeat the experience year after year. If we are not to reduce our stipends once again to noncompetitive levels, and if further downsizing is not an option, then we must replace some of the current graduate student teaching with other types of instruction, while not reducing the amount of funding that we are now devoting to support of graduate students. This is, in my view, an important challenge facing the university: a challenge for fundraising in the campaign, and a challenge that intimately links the need for high quality instruction in both graduate and undergraduate education.

Finally, I would want to comment on Duke’s effort to achieve diversity in its graduate programs. As stated above, Duke has an important role in training a pool of high quality Ph.D.s who can serve as future faculty for the nation’s colleges and universities. In the Black Faculty resolution of 1987/88, Duke committed itself not only to increasing the number of its own African-American faculty, but also to substantially increasing its training of African-American Ph.D.s to add to the limited pool of black faculty candidates in the U.S. By devoting its resources toward this goal, and largely under the leadership of then Assistant Dean Jacqueline Looney in the late 1980s and early 1990s, Duke’s Graduate School increased the number of African-American graduate students from 46 in 1988 to 114 in 1998. (The great majority of these students are Ph.D. students.)

Because of the long time it takes to obtain the Ph.D. degree, we are just now seeing the production of double-digit numbers of black Ph.D.s each year from Duke. Because of the careful selection of these students and the financial support provided by
the Duke Endowment fellowship program for minority students, Duke has an admirable record of low attrition in this student population. Duke has also successfully increased its population of all U.S. minority graduate students over the same decade (from 105 to 237). Even so, I am concerned that the proportion of minorities in the total population of Duke graduate students, at 10% (African Americans are 5%), remains too low. There is also at Duke, as elsewhere, very little representation of African-American and other underrepresented minority Ph.D. students in the sciences and engineering, fields in which the pool of minority Ph.D.s is particularly low. (There is also an insufficient representation of women in our Ph.D. programs in the physical sciences and engineering.) I know that the Graduate School has been concerned about this situation and has been particularly disturbed by the relatively small growth in recruitment of minority students since Dr. Looney left Duke to join the Mellon Foundation in 1994. A task force appointed by the Dean of the Graduate School has come up with significant recommendations to reinvigorate Duke’s effort in minority student recruitment and retention. I am most pleased to report that the Graduate School has been able to woo back Dr. Jacqueline Looney to head that effort as its new Associate Dean of Graduate Student Affairs and Assistant Vice Provost for Academic Diversity. With her leadership, I hope that the Graduate School can regain its momentum in the important objective of diversifying our graduate student body.
VI. DIVERSITY AT DUKE

While a hundred years ago almost all universities catered to white males, in both student and faculty ranks, today almost all universities believe that they cannot really be strong if they do not have a diverse student body and faculty. There are a number of arguments why diversity is both necessary and valuable to the intellectual life of a university. At the basic level it is a simple matter of fairness. Any person who meets Duke’s qualifications should be welcome as a student or faculty member at Duke. Much has been written and spoken, often heatedly, about the question of merit, and the phrase “meeting Duke’s qualifications” has sometimes come into question. Let me state here that “merit” is a complex notion not capable of being reduced to one or two matrices, and our comprehensive method of selection of undergraduates is designed in recognition of that fact. Moreover, given their historic discrimination against women, African Americans, Hispanics, Asians, and Native Americans, universities, in my opinion, have a moral obligation to make special efforts to recruit these groups. For its own historic reasons, as a southern institution, Duke has special reasons for paying attention to African Americans.

Protests against racial segregation became more prominent at Duke in the 1940s than ever before, but the University leadership resisted admission without regard to race or creed at that time, maintaining with the South as a whole a legally mandated system of racial separation. As Robert Durden notes of the decade that followed, “In light of Trinity-Duke’s history, the Duke family’s conspicuous fairness toward African Americans, and the cosmopolitan nature of the university’s faculty and student body,
Duke stood at a critical junction in the 1950s." Petitions in the 1940s from Divinity School students and faculty had already asked for integration of the student body. It was not until the 1960s, however, under extreme strategic pressure from top university administrators, that the Board of Trustees in March 1961 agreed that the graduate and professional schools could integrate: six students subsequently registered that fall and three withdrew, leaving only two African Americans in Law and one in Divinity. In June of 1962, the Board said that the undergraduate student body could be integrated as well; in September of 1963, five undergraduates enrolled. Among Southern private universities, Duke was only about midpoint in the inclusion of African-American students.

The courts are increasingly impatient with historical redress as a rationale for minority admissions, and societal discrimination is simply not permissible. Therefore, I would stress that in addition to the historical reasons for increased diversity at the present, there are compelling intellectual reasons as well. The heart of a university is the exchange and debate over ideas. This process is more dynamic and far-reaching when students and faculty come from many backgrounds and hold different points of view. At a meeting last year of the American Association of Colleges and Universities (AAC&U), sociologist Troy Duster remarked that at the Berkeley Law School recently, some white students said that they felt robbed because there were no African-American students in their class. Fortunately, over the last several decades most universities have embraced the importance of increasing the diversity of the student body and faculty, and Duke has been part of this movement. With the guidance of our Strategic Plan for Black Faculty

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Development we have increased our black faculty in the regular ranks by 62% (from 45 to 73) between 1993 and 1998, though by only 25% (36 to 48) in tenure track positions. The most recent results of a Harvard-coordinated survey of 15 selective universities shows Duke with only a 9th rank out of fourteen in the percentage of non-medical African-American full professors, whereas we move up to second place at the assistant professor level. This progress at the junior level is reversed in the Medical School, where we are stronger in the senior ranks. Overall, in 1996/97, black faculty accounted for less than 3% of our tenured and tenure track ranks, a little lower than the mean of the 15 schools in the Harvard survey; Hispanic faculty at about 2% were at the mean, and Asians, at 5%, were below the mean by one percentage point. This is an area, obviously, in which we must maintain constant attention. To that end I created an ad hoc committee several years ago that meets regularly to discuss strategy and performance.

In terms of our graduate and professional students I am happy to acknowledge the particular success of our Medical School: with the vigilant efforts of Associate Dean Brenda Armstrong it has put Duke on a par with Yale and way ahead of everyone else in matriculating underrepresented minorities (22% of this year’s class). Another highlight is Fuqua’s receipt of the 1997 Outstanding Educational Institution Award from the National Black MBA Association for “great contributions toward encouraging African Americans to enter the field of business”; 14.5% of Fuqua’s entering class this year is composed of underrepresented minorities, and 15% of the doctoral students are African American. The Law School in 1998 had its best recruiting year ever, with 50% of the class composed of women and 18% of underrepresented minorities. In following the Strategic Plan for Black Faculty Development, Duke has sought to increase our numbers of African
Americans who might enter academic careers: we have moved from 52 to 79 in the numbers of black students enrolling in doctoral programs between 1993 and 1997 (and last May graduated one of only a half dozen African-American Ph.D.s in physics). While strong strides have been made, there is much to do. Ideally, over the long run, the mix of students and faculty should be a mirror of the population at large in the U.S. Given the socio-economic situation of many of these groups and Duke’s objectives for higher education, reaching this goal will take time. Unfortunately it appears that universities tend to react like this problem is a sprint, when it is really a marathon, or maybe a marathon on a steeple chase course, where it is easy to fall if you are not continuously mindful.

I want to pay special attention to matriculant data for the undergraduate body at Duke, since it reveals the distance that we have come over the last fourteen years, especially in the recruitment of African Americans and students of Asian descent. In the fall of 1984 we had 56 Black students, less than 4% of the class; 26 Hispanics, less than 2%; 43 of Asian descent, less than 3%, and all of 3 Native Americans. During its recent history, Duke has concentrated on increasing the percentage of African American students, and has been successful in that area. The percentage had been hovering around 7-8%, which put us in 1997 behind Columbia and Harvard but on a par with Stanford and better than Princeton, Yale, Brown, Dartmouth and Penn. As a result of aggressive recruiting by the Office of Admissions, the number of African Americans matriculating in fall 1998 constitutes almost 10% of the class, our highest percentage to date—and it is a strong group. Because the percentage of African Americans in the college age cohort in this country is about 12%, I would be very pleased to see Duke in the 11% to 12% range
in five years. Given our location, 10% may be more realistic (but, then, I'm not sure that skeptics would have thought we'd be able to reach 9.7% this year, after the downturn in applications from this group in 1997). I should note that our yield percentage of African-American accepted students—like our yield of students as a whole—lags well behind most of our peers and competitors.

In recruiting students of Asian background we have achieved the most dramatic increase, to 14% of the entering class in 1998; yet here we lag way behind our competitor institutions. With Hispanics as well, although we have matriculated a high of 83 this year, at less than 5% we are again behind what I would consider a benchmark standard of at least 6%. The situation with Native Americans deserves attention in the future, especially since North Carolina has one of the highest Native American populations in the nation. And I would add that without financial aid for international students, we will not be terribly successful at matriculating many more than our current small number—less than 4%—of the undergraduate student body, and certainly not a diverse population. We absolutely cannot move beyond the most economically privileged international students without some form of assistance to offer them.

Duke does not have a quota system for its undergraduates, nor a fixed percentage in mind for particular cohorts. We recognize that intragroup differences are as salient as those between groups, and that each student is a unique individual, judged for admissions on his or her own merits. The point is simply that we need to matriculate a diverse class whose members will contribute to the intellectual and social developments of each other and to the institution as a whole. An increasing body of data on the effects of diversity on college campuses and beyond is now available to undergird our efforts; indeed, the
American Association of Colleges and Universities, with support from the Ford
Foundation, has just published an overview of the latest research along with annotated
bibliography of more than 300 research studies in its Diversity Works: The Emerging
Power of How Students Benefit.

Derek Bok and William Bowen, in their very recent book on the consideration of
race in the college admissions process, The Shape of the River, report that “the ability to
get along well with people of different races” has been increasingly designated as
important to both majority and minority cultures. The authors conclude, “as the
population of the country becomes ever more racially diverse, and as white Americans
see their dominant majority status erode, the need to work effectively with individuals of
other races will become an increasingly inescapable reality to members of every racial
group. In the business and professional worlds and in much of civic and public life, white
enclaves will be less and less imaginable.” 24 In addition, the authors found that white
students who interacted more with black students were much more satisfied with their
college education as a whole; although outgoing students might be expected to enjoy
their experience more, the presence of diverse populations was identified through
interviews as “certainly a ‘plus.’” 25 Research indicates that exposure to people of
different backgrounds and cultures is one of the four most influential aspects of the
undergraduate experience. 26

25 Ibid., p. 240.
354.
Of course we are dealing with more than an issue of increasing our numbers and becoming a heterogeneous mirror of society. In classroom and residence hall, on campus bench and at dining table, it sometimes looks at Duke as if we have a segregated campus. Self-selection—the word “balkanization” has been used in recent years—is not a bad thing in itself, given the human propensity to seek the comfort of likeness; and to the degree that it fosters a sense of well-being, associating with others with whom one identifies provides a nurturing environment. Indeed, as suggested at a recent American Association of Colleges and Universities conference by Beverly Daniel Tatum—Mt. Holyoke professor and dean, and author of Why Are All the Black Kids Sitting Together in the Cafeteria? And Other Conversations About Race—retreating to such islands of likeness replenishes the energies and permits engagement with the wider community. We certainly do wish to encourage this bridging with others, for (as other scholars put it) “when unlike minds meet, the dissonance can potentially create a new reality. Viewed in this light, diversity is forging a transforming society that will not condone traditional stereotypical boundaries.”27 Like most things in life, we are dealing here with a question of balance.

What we need to do is to examine closely the kinds of barriers that we may be unintentionally creating that impede learning from diversity. (An example is the financial aid structure that may have fostered the clustering of African Americans on one campus. A recommendation is before the administration to address this problem.) We need to determine the optimal programs and policies for encouraging not only interaction, but

also learning from interaction. Although we continually examine climate issues for all our students, we should be particularly sensitive to the kind of climate we are providing for our minority students, particularly African Americans. Graduation statistics show that although we do fairly well compared to other schools, our African-American males graduate at a lower rate than their Duke counterparts. Moreover, at Duke—as at other institutions—our African-American undergraduates in general underperform based on their admissions rating scores. Much attention has been paid to these issues at Duke in recent years, in venues ranging from a committee on student support services, to an ad hoc meeting on issues facing African Americans on this campus, to the Provost’s task Force on Faculty and Students, to the ongoing work of the President’s Council on Black Affairs. It is difficult to get a handle on classroom climate, since cues are often oblique, but certain aspects of our campus, including residential life, undoubtedly reinforce feelings of not belonging at Duke.

According to Bok and Bowen’s exhaustive analysis of more than 45,000 students, including Duke students, “the long-term consequences of considering race in college and university admissions” (the subtitle of their book *The Shape of the River*) are positive. Attendance at selective colleges is beneficial for the professional and personal attainments of black and white students alike, in part from the interactions with each other. For blacks in particular, gains are demonstrated not only over blacks at less selective schools, but also over whites at their own most selective ones: black graduates are more likely than whites to go on for graduate degrees and to become leaders in community and professional organizations, for example. Indeed, intuitive if not data-based understanding of this fact has kept many an African-American undergraduate on
Duke’s campus in spite of the negative atmosphere here that many black students have reported.

Now that we have some hard data to indicate the relevance of diversity to a successful college experience, during college and afterwards, it is time for us to focus more intensively on making the Duke experience not only productive but also transforming for all our students. Too few of our students are satisfied with either the climate for minorities or ethnic/racial diversity on this campus (see Table 8.); too few leave here thinking that Duke has even moderately enhanced their abilities to relate to different types of people. We are looking hard at our residential policies in this light; we are building new structures, both literally and figuratively, such as the Center for Jewish Life and the enhanced support for Reginaldo Howard Scholars; we are gradually making our campus more physically accessible; we have included a session on diversity in the classrooms as part of the provost-sponsored new faculty orientation in the fall; we are revising our Arts and Sciences curriculum. Recognizing the unique opportunity we have to make a difference, given our largely residential campus with a largely 18-22 year-old undergraduate body, we must set as a firm goal the enhancement of the desire and the skills to learn from others. Our students’ overall cognitive and social development depends on it. In my almost five years as provost I have set a high priority on these matters, and I would hope that this priority will guide Duke University’s future in the years to come.
VII. CONCLUSION

In this piece I have tried to think about Duke in broad terms and to concentrate on areas and issues that have broad impact across many schools. My focus throughout is on crosscutting intellectual areas rather than on in-depth analysis by school; in this approach, the core missions of the professional schools are not addressed as such. I have tried to give enough detail to put the issues in perspective, and when I felt that there were especially important points to make in some areas I have gone into more detail than in others. Since I see the audience itself as broad, ranging from the faculty and students to the Board of Trustees, there is perhaps more detail overall than if for a select audience. However, I have not attempted to “cover the waterfront” of this complex and challenging institution that is Duke University.

It is important for me to state what this document is not as well as what it is. The document is not a strategic plan, with a detailed set of recommended actions, though I have given a number of suggestions for steps I would like to see taken. It is, I trust, a “think piece” that will be discussed and debated within the community; I also hope that, by means of these conversations, it will lead to substantive actions over the next five to ten years. While I do provide in the text some analysis and estimates of the costs of these recommendations, they are preliminary only.

Early in the piece I mention that our strategic plan, *Shaping Our Future*, had stated “growth by substitution” as a principle for planning: the principle that dictates the cessation of some projects in order to have the resources to inaugurate others. For several reasons I have not tackled that issue here. First, if Duke wants to take that approach it needs to look campus wide, and I have centered this piece on academic issues alone.
Second, I recognize that some downsizing has already occurred, most notably in the graduate programs. In addition, the deans have certainly been making ongoing trade-off decisions in their own schools. Third, we have recently announced a $1.5B campaign, and I expect that through this massive effort Duke will be able to make major improvements to the four central, broad academic areas I have targeted. I would hope that, as a result, all four areas will in several years be far stronger than they are today.

Part of the process for attaining the needed resources should be decreasing the emphasis in some sub-areas in order to maximize the impact of the fundraising. However, a rough calculation suggests that if the campaign is successful in bringing in endowment money for financial aid and faculty chairs, then about $15-20M in new endowment income would become available for support of the academic enterprise. This amount would permit the implementation of a significant percentage of the initiatives I have discussed. We will also have to have high expectations for research productivity in the science and engineering fields.

In the body of this document I have made many recommendations, stemming from sometimes disparate and sometimes convergent impulses such as the building on current strengths, the targeting of opportunities, and the need to make corrections in policy or practice. Let me summarize them here in the order of what I consider their importance for attention. The recommendations in this list are predicated on the success of the Capital Campaign, and my focus is on steps we must take in order to break out of the mold of "business as usual":
Investments for Academic Excellence

Step 1: Starting now or in progress

A. Rebuild English and strengthen romance languages, philosophy, and other humanities units

B. Concentrate on improving undergraduate education.

C. Continue to invest in the biomedical sciences, including creation of a genetics institute.

Step 2: Begin in the next year or two

A. Create an intellectual center for the humanities and social sciences.

B. Concentrate on building economics with a coordinated plan across the economics department, Fuqua, NSOE and Law, hence adding on the order of 15 new economists and finance faculty across the institution.

C. Develop additional strength in the social sciences with 10 further appointments in Arts and Sciences.

Step 3: Building Science and Engineering over the next five to ten years

A. Invest in the four basic physical sciences of mathematics, physics, chemistry, and computer science, focusing on recruiting on the order of 20 new senior science faculty.

B. Invest in the Engineering School, concentrating on building strength in electrical and computer engineering and in mechanical engineering and material sciences so they can move significantly higher in the rankings.

As noted at the start, Duke is a major research university that aspires to contribute to the major intellectual debates and breakthroughs of our time while providing outstanding education to the undergraduate, graduate, and professional students. It can fairly be said that Duke stands out in higher education for its rapid rise in the academic ranks over the
last thirty years. In this document I have attempted to assess some possible strategies for the future—strategies that would enable Duke to compete more strongly with the very best universities in the country. Duke is well positioned for the future and a number of opportunities are before it. On the other hand, the path before Duke is more difficult and challenging than in the past. I liken the challenge to climbing Mt. Everest: hiking the first 90% does not mean you will make it to the top unless you are extra well prepared, make the right decisions, and have some excellent luck. Business as usual will not do it.

My “blueprint” for positioning Duke University to enter the next century at the top of its form, and at the top of the ranks of research universities, has derived from my thirty-plus years as a faculty member and administrator. I have been privileged to be so integrally involved in higher education over these decades, and privileged to be Duke’s provost. Working with such a dedicated group of individuals in the faculty and administration, as well as on the Board of Trustees and among the student body, has been a mainstay of my provostship, and I wish to end by acknowledging the wisdom and good judgment—not to mention the generosity--of these many colleagues. It is with confidence in Duke’s future that I look toward the realization of those “outrageous ambitions” to which Terry Sanford referred—ambitions that animated our founding benefactors, faculty, administrators and students when, in 1925, they took a leap from small regional college into the as-yet-unknown, but well charted, territory of major national university.
VIII. APPENDIX: CHARTS AND TABLES
### Table 1. FACT FILE: Elite Private Universities

<table>
<thead>
<tr>
<th>Name</th>
<th>Date Founded</th>
<th>Total UG Enrollment</th>
<th>Total Enrollment</th>
<th>% UG Total</th>
<th>Student/Fac Ratio</th>
<th># Applicants</th>
<th>Selectivity Rate</th>
<th>Yield Rates</th>
<th>A&amp;S Faculty</th>
<th>Faculty Total Faculty</th>
<th>% A&amp;S of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown</td>
<td>1764</td>
<td>5,642</td>
<td>7,177</td>
<td>79%</td>
<td>8/1</td>
<td>14,900</td>
<td>18%</td>
<td>53%</td>
<td>439</td>
<td>506</td>
<td>87%</td>
</tr>
<tr>
<td>Columbia</td>
<td>1754</td>
<td>5,488</td>
<td>16,115</td>
<td>34%</td>
<td>7/1</td>
<td>11,188</td>
<td>17%</td>
<td>49%</td>
<td>473</td>
<td>853</td>
<td>55%</td>
</tr>
<tr>
<td>Cornell</td>
<td>1865</td>
<td>7,934</td>
<td>11,391</td>
<td>70%</td>
<td>9/1</td>
<td>14,554</td>
<td>35%</td>
<td>41%</td>
<td>429</td>
<td>767</td>
<td>56%</td>
</tr>
<tr>
<td>Dartmouth</td>
<td>1769</td>
<td>3,932</td>
<td>5,129</td>
<td>77%</td>
<td>10/1</td>
<td>10,647</td>
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<td>47%</td>
<td>321</td>
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<td>11/1</td>
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<td>30%</td>
<td>40%</td>
<td>438</td>
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<td>6,784</td>
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<td>16,597</td>
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<td>3,882</td>
<td>7,472</td>
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<td>66%</td>
<td>553</td>
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<td>5,357</td>
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<td>6,375</td>
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<td>40%</td>
<td>277</td>
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<td>64%</td>
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<td>5,361</td>
<td>62%</td>
<td>30%</td>
<td>575</td>
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<td>23%</td>
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<td>61%</td>
<td>475</td>
<td>695</td>
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**Enrollment:** Source IPEDS Fall 1997 Enrollment Survey. Includes full-time, degree-seeking students only.

**Student/Faculty Ratio:** Source U.S. News & World Report

**Faculty Counts** include tenured and tenure track only. Source for Arts & Sciences data is the Columbia Inter-University Salary Information Exchange; the source for the total faculty is AAUP. Excludes Medical Center Faculty.
Table 2. U.S. News Program Rankings

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<th>Medicine</th>
<th>Hospital</th>
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<td>8</td>
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Source: *U. S. News and World Report*
Data indicates year of publication.
Table 3. U.S. News & World Report Rankings for Graduate and Professional Programs

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<td>See 1996</td>
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<td>See 1995</td>
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(continued next page)
(continued from previous page)

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Arts & Sciences Divisions are on a three-year rotation; Social Sciences last ranked in 1995.
Shading indicates that a particular program was not included in the rankings for that year.
"Not ranked" indicates that Duke was not among the top ranks.
Table 4: National Research Council Ph.D. Program Rankings (Faculty Reputation)

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NR = not ranked
Table 5. 5 Year Average Annual Growth Rate in Unrestricted Funds Adjusted for Inflation

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<tr>
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<td>22.6%</td>
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Notes: All dollars were adjusted by CPI. Core expenses are those over which a school has direct control and are calculated by subtracting each school's financial aid expenses and required contribution to academic and administrative support costs from its total revenue. Data reflect unrestricted resources only, except in the Medical School, which is predominantly financed by other sources.
Table 6. Comparative Yield at Elite Private Institutions

Fall 1985 through Fall 1997

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</table>
Table 7. Admissions Success in Relation to Top Overlap Schools

% common admits attending Duke
• % common admits attending other institution

Source: Office of Undergraduate Admissions
Table 8. Selected Senior Survey Measures

1. Extent to Which Capabilities Were Enhanced

![Bar chart showing the extent to which different capabilities were enhanced for Writing, Thinking, Quantitative, Foreign Language, Culture/History, Ethical Issues, Leadership, Teamwork, Independent Thinking, and Relate to Different.]

Percent Skills Enhanced Greatly or Moderately:

- **Duke**
- **SHYP**
- **Peer**

"SHYP" = Aggregate data from Stanford, Harvard, Yale, and Princeton
"Peer" = Aggregate data from Brown, Columbia, Cornell, and Dartmouth

(Continued next page)
2. Satisfaction Levels

![Bar chart showing satisfaction levels for various aspects of college life, including Instruction, Classes available, Class size, Libraries, Computing, Faculty out of class, Independent study, Housing, Ethnic/racial diversity, Climate for minorities, and Admin. Responsiveness.]

“SHYP” = Aggregate data from Stanford, Harvard, Yale, and Princeton
“Peer” = Aggregate data from Brown, Columbia, Cornell, and Dartmouth
Table 9. Summary Measures of Seniors’ Satisfaction

How satisfied are you with your overall educational experience?

<table>
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<th>Very Dissatisfied</th>
<th>Generally Dissatisfied</th>
<th>Ambivalent</th>
<th>Generally Satisfied</th>
<th>Very Satisfied</th>
<th>Generally or Very Satisfied</th>
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<tr>
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<td>54.4%</td>
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Would you encourage a high school senior to attend your college?

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<th>Probably Not</th>
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<th>Probably Would</th>
<th>Definitely Would</th>
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</table>

"SHYP" = Aggregate of data from Stanford, Harvard, Yale, and Princeton
"Peer" = Aggregate of data from Brown, Columbia, Cornell, and Dartmouth