

Periodic Review Report

for the

Middle States Association Commission on Higher Education

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Hunter R. Rawlings III

President

Accredited since: 1921

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Last reaffirmed: 1992

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TABLE OF CONTENTS

[LIST OF FIGURES](#)

[LIST OF TABLES](#)

[I. PROLOGUE AND EXECUTIVE SUMMARY](#)

[II. INTRODUCTION](#)

Overview of the University
Significant Developments and Changes
Mission and Values
Composing the Cornell of the Future
Areas of Focus
Reaffirming Affirmative Action
Financial and Physical Development of the Institution

[III. EVIDENCE OF CONTINUOUS INSTITUTIONAL SELF-STUDY AND PLANNING](#)

[Instruction, Academic Innovation, and Assessment](#)

Strategic Planning Task Force on Educating the Leaders of Tomorrow
Strategic Planning Task Force on Graduate and Professional Education
Strategic Planning Task Force on the Generation and Application of Knowledge
Academic Innovations
Recent Survey Research
Enrollment and Graduation Trend Data
Enrollment Projections

[Staffing Patterns](#)

[Outreach and Service](#)

Cornell Cooperative Extension
Industrial and Labor Relations Extension
Agriculture Experiment Stations

Veterinary Teaching Hospital and Diagnostic Laboratory
Cornell University Outreach Council
Cornell Office for Technology Access and Business Assistance
Other Outreach and Service

Information Technologies

Infrastructure Development
Use of the Infrastructure
Future Plans

Institutional Management

IV. STATUS OF 1991 SELF-STUDY "AREAS OF SPECIAL EMPHASIS"

Interaction of the Endowed and Statutory Colleges
Science and Technology
Student Services

V. REFERENCES

LIST OF FIGURES

1. Strategic Planning Stakeholder Analysis Survey: Current and Ideal Importance of Teaching and Research
2. 1994 COFHE Senior Survey: Satisfaction with "Class Size" and "Out-of-Class" Availability of Faculty," 14 COFHE Universities
3. Women as a Proportion of Enrollment, Fall 1990 - Fall 1995
4. Minorities as a Proportion of Enrollment, Fall 1990 - Fall 1995
5. Indexed Change in Total Enrollment, Fall 1990 - Fall 1995
6. Indexed Change in Undergraduate Enrollment, Fall 1990 - Fall 1995
7. Indexed Change in Graduate Enrollment, Fall 1990 - Fall 1995
8. Indexed Change in Professional School Enrollment, Fall 1990 - Fall 1995
9. Graduation Rates of First Time Freshmen Graduating Within Six Years of Matriculation, Fall 1980 - Fall 1989 Entering Cohorts
10. Six Year Graduation Rates by Racial/Ethnic Group, Matriculating Cohort Fall 1980 - Fall 1989

LIST OF TABLES

1. 1994 COFHE Senior Survey Academic Life Factor
2. Sample Cornell Cooperative Extension Programs
3. Changes in Fund Balances

[4. Current Fund Revenues](#)

[5. Current Fund Expenditures](#)

PROLOGUE AND EXECUTIVE SUMMARY

In October of 1991 the eleven member reaccreditation site visit team representing the Middle States Association Commission on Higher Education (MSA/CHE) characterized Cornell as "a great university; an acknowledged center for discovery, academic leadership and service; and, in a very real sense, a world treasure." (Evaluation Team, 1991). Their recommendation led MSA/CHE to reaffirm the accreditation status of Cornell University without condition, the most coveted reaffirmation status offered. In the normal course of events in the reaccreditation cycle, five years after a site visit, each Middle States post-secondary institution is required to prepare a Periodic Review Report which serves as the basis for deciding whether or not to continue accreditation status through the next regularly scheduled site visit.

The document that follows provides neither an exhaustive nor a fully comprehensive summary of Cornell University. Everything that could be said, has not been detailed. Rather, we have used the occasion of preparing this Periodic Review Report both to give a partial accounting of what has transpired at Cornell since our reaccreditation site visit in October of 1991 and to suggest what are likely to be the key issues the institution will face prior to our next decennial site visit in 2001. It is intentionally a descriptive rather than prescriptive document.

If ever there is an opportune time to carry out such an endeavor, this may be about as close as an institution can get. Having spent the better part of the last three years of Frank Rhodes' eighteen year presidency in a university-wide strategic planning effort, taking stock of where we've recently been makes perfectly good sense. As well, with the inauguration of Hunter Rawlings as Cornell's tenth president during the 1995-96 academic year, making the effort to look ahead to where we should be focusing our attention is equally important.

This document was produced in a rather synthetic fashion under the watchful eyes of the [Periodic Review Report Oversight Group](#) (membership is indicated on the inside cover of the report). They began their work during the summer of 1995 and produced a draft for public review and comment that was released to the entire Cornell community in November 1995 as an insert in *The Cornell Chronicle* as well as being available on the World Wide Web. After a two month period where comments and suggestions to the draft document were received, the Oversight Group made final changes to Periodic Review Report in February 1996.

This Periodic Review Report has three main sections. The first provides a general overview of Cornell University and discusses the significant developments and changes that have taken place over the first half of this decade. Included in this section is a brief introduction to the university-wide strategic planning effort that spanned academic years 1993-94 through 1994-95. The tangible products of the planning effort are still emerging

but they produced a new university mission and values statement, engaged all of the university's constituencies in a frank examination of the realities facing Cornell, and opened the deliberation processes preceding decision making to a broader and more diverse group. Among the emergent issues from the planning process that are described in more detail throughout later sections of the Periodic Review Report are program review; academic appointment, promotion, and tenure decisions; and closer collaboration among Cornell's various colleges.

The introduction also describes in some detail the administrative transition that has recently taken place among Cornell's executive staff and the successful completion of a \$1.5 billion capital campaign to re-endow the university. This section concludes with a thorough detailing of the continuing development of the physical plant on the Ithaca campus. New construction, rehabilitation, remodeling, and renovation projects that have been completed since 1990, are currently under construction, or are in various stages of planning are described.

The second section of the Periodic Review Report provides evidence of continuous institutional self-study and planning. Descriptions of the deliberations and recommendations from Strategic Planning Task Forces on Educating the Leaders of Tomorrow, Graduate and Professional Education, and the Generation and Application of Knowledge are provided. In addition, academic innovations that have become operational over the past five years are detailed, including major undergraduate and graduate curricular revisions in several of the colleges, efforts to improve the instruction of introductory calculus, and programs designed to expand the opportunities for undergraduates to be significantly engaged in the research enterprise of Cornell. Innovations and developments in outreach, service, and information technologies are also discussed.

This second section also discusses the results of several institutional specific and consortial surveys of students, faculty, staff, graduating seniors, and alumni that help both to gauge individual satisfaction with Cornell as a workplace and to place in context the general value, relative benefits, and specific gains of a Cornell education. Descriptions of enrollment trends and staffing patterns help to further contextualize this information. Total enrollment on the Ithaca campus has risen less than three percent between 1990 and 1995 (from 18,389 to 18,890). At the same time, the total workforce of the university, excluding the medical programs in New York City, has decreased three percent (from 9,307 in 1990-91 to 9,028 in 1994-95)

The second section closes with an analysis of Cornell with respect to institutional management. While Cornell has not been immune to the financial pressures facing all of higher education, the institution continues to be fiscally sound. In addition to describing an overall stable financial picture that has been maintained in spite of serious internal and external pressures, this section highlights several changes in university decision making and governance structures. Included here are descriptions of the Budget Planning Group, the Capital Funding and Priorities Committee, and the creation of a Faculty Senate to replace the previous Faculty Council of Representatives.

The third section provides a brief commentary on developments in the three "areas of special emphasis" from our 1991 reaccreditation self-study: the interaction of the endowed and statutory colleges; science and technology; and student services. In most cases, the major highlights of continuing development in these three areas were naturally described in earlier sections of the Periodic Review Report. Nevertheless, prose devoted to the interaction of the endowed and statutory colleges recounts continuing efforts to reform the manner in which the relative charges for instruction between the endowed and statutory colleges -- known as accessory instruction -- are handled.

The section on science and technology primarily provides most of the theoretical underpinnings from the work of the Strategic Planning Task Force on the Generation and Application of Knowledge as most of that Task Force's recommendations and subsequent practical implications are described in rather full detail in the second section of the Periodic Review Report. The final section, relating to student services highlights organizational and structural changes that have transpired in this area -- including the creation of a chief student affairs officer position that reports directly to the President -- as well as describing work being done to develop a common freshmen experience for all Cornellians and efforts to better understand and deliver programs to Cornell's residential communities.

INTRODUCTION

Overview of the University

Cornell University is a private, not-for-profit, coeducational, nonsectarian institution of higher learning chartered and operated under the Laws of the State of New York. Cornell was founded by Ezra Cornell, whose original endowment was augmented by a substantial land grant from the State of New York, received under the Federal Land Grant (Morrill) Act of 1862.

Ezra Cornell envisioned a "university of the first magnitude," embracing both classical and practical studies, which would become the "seat of learning in America." The University's first president, Andrew Dickson White, shared this vision. While still a New York State Senator, he formulated principles to guide the new institution toward becoming a place of "most highly prized instruction," and an "asylum for science, where truth shall be sought for truth's sake." Both men drew inspiration from Senator Justin Morrill, father of the land-grant act, who sought, through the land-grant universities, to provide instruction in agriculture and the mechanic arts.

As Frederick Rudolph noted in his book, *Curriculum*, "Cornell brought together in creative combination a number of dynamic ideas under circumstances that turned out to be incredibly productive . . . Andrew D. White . . . and Ezra Cornell . . . turned out to be the developers of the first American university and therefore the agents of revolutionary curricular reform."

Today Cornell is composed of thirteen schools and colleges: eleven in Ithaca and two--the Medical College and the Graduate School of Medical Sciences--in New York City. Between those two locations there are approximately 13,000 undergraduate and 6,100 graduate students, 2,200 faculty, and 9,600 staff. The main campus in Ithaca includes 260 major buildings. The University also owns or occupies 11 buildings in New York City and 45 buildings at the New York State Agricultural Experiment Station in Geneva, New York.

Because Cornell is an Ivy League university and also the land-grant institution of the State of New York, it is supported by a unique combination of private and public funds. The privately funded schools and colleges (the endowed colleges) in Ithaca are the College of Architecture, Art, and Planning; the College of Arts and Sciences; the College of Engineering; the School of Hotel Administration; the Law School; the Samuel Johnson Graduate School of Management; and the Graduate School. The endowed units of the medical division are part of the New York Hospital-Cornell Medical Center. Four state-supported colleges are operated by the University on behalf of New York State in accordance with statute or contractual arrangements under the general supervision of the trustees of the State University of New York. The annual state appropriations for the statutory colleges and income generated by their operation are restricted to their exclusive use. These units include the College of Agriculture and Life Sciences, the College of Human Ecology, the School of Industrial and Labor Relations, and the College of Veterinary Medicine. The New York Agricultural Experiment Station at Geneva is a unit of the College of Agriculture and Life Sciences, and its departments are integral parts of the college. The four statutory colleges have been assigned specific responsibilities in research and extension directed to state needs. These very specific statutory requirements for research and extension activities do not exist for other campuses of the State University of New York.

Significant Developments and Changes

The 1991 reaccreditation site visit team anticipated much of what was on the horizon for Cornell when they wrote in their evaluation report:

Although Cornell University is a highly diverse and decentralized university, the team was struck by the fact that Cornell is more than the sum of its parts. Throughout the University community, whether one speaks to students, faculty, staff, alumni or trustees, there is a strong identification and easily recognizable loyalty to Cornell as an institution. There appears to be a high degree of mutual trust among the deans, members of the faculty, the administration and the Board of Trustees. All appear to be motivated by and working toward the greater interests of the University. . . .

At the same time, we detected a concern for what may lie ahead, particularly in an environment characterized by increasing financial pressure. The choices Cornell will confront may be ones for which the

experience of the last decade may provide inadequate preparation. The current style of governance and decision making, characterized by decentralization and entrepreneurial freedom, may be strained in an environment of diminishing resources. To the extent these concerns are valid, the challenge confronting Cornell will be to find new ways of making difficult decisions without radically undermining the special strengths and unique qualities of either the parts of the University or the whole. (Evaluation Team, 1991)

In part in response to this assessment, Cornell embarked on a major, university-wide strategic planning effort that engaged the whole university in a focused exercise of institutional self-examination. The tangible products of this initiative are still emerging, but they produced a new university mission and values statement (see below), engaged all of the university's constituencies in a frank examination of the realities facing Cornell, opened the deliberation processes preceding decision making to a broader and more diverse group, and precipitated the emergence of several significant issues that will be of primary importance over the next half-decade. Among the emergent issues are the need for systematic and substantive academic and administrative program reviews; for more coordinated procedures for academic appointments, promotions, and tenure decisions; and for reexamining the impacts and consequences for Cornell of the end of mandatory retirement for faculty. More generally, there is a growing awareness of the need to cultivate a closer collaboration among the various colleges has become prevalent.

The strategic planning effort also stimulated the creation of a new university-wide group -- the Academic Leadership Series (ALS). Its nearly 500 participants are primarily faculty, along with the university's executive staff and a modest number of other university administrators. At its semi-annual full day sessions led by members of the faculty, the ALS has become an important vehicle for deliberation about the emerging issues facing the university.

Mission and Values

Cornell is a learning community that seeks to serve society by educating the leaders of tomorrow and extending the frontiers of knowledge.

In keeping with the founding vision of Ezra Cornell, our community fosters personal discovery and growth, nurtures scholarship and creativity across a broad range of common knowledge, and engages men and women from every segment of society in this quest. We pursue understanding beyond the limitations of existing knowledge, ideology, and disciplinary structure. We affirm the value to individuals and society of the cultivation of the human mind and spirit.

Our faculty, students, and staff strive toward these objectives in a context of freedom with responsibility. We foster initiative, integrity, and excellence, in an environment of collegiality, civility, and responsible

stewardship. As the land grant university for the State of New York, we apply the results of our endeavors in service to the community, the state, the nation and the world.

*I would found an institution where any person
can find instruction in any study.
Ezra Cornell, 1865*

A number of other significant developments and changes have taken place at Cornell since our decennial self-study and site visit in 1991. Among the most visible has been a dramatic, yet remarkably orderly, change in the institution's senior administrative ranks. Through a combination of retirements, relocations, reorganizations, and deaths the institution has had an opportunity both to promote individuals from both Cornell and outside into positions of leadership.

During the summer of 1995 a new President; a new Provost; a new Dean of Agriculture and Life Sciences; a new Dean of Veterinary Medicine; a new Senior Vice President; a new Vice President for Academic Programs, Planning, and Budgeting; a new University Counsel; a new Vice President for Information Technologies; and an acting Vice President of Public Affairs took office (detailed organizational charts can be found in the appendix). In February 1996, the incumbent acting Vice President of Public Affairs was named Vice President for Alumni Affairs and Development. In addition, between 1991 and 1995 there were new Deans appointed in the College of Arts and Sciences and the College of Engineering.

During the past five years, the position of Vice President for Facilities and Campus Services was created as was the position of Vice President for Student and Academic Services. Over the course of the 1995-96 academic year, searches are being conducted to identify new Deans for the College of Architecture, Art, and Planning, the College of Arts and Sciences, the School of Industrial and Labor Relations, as well as to select the next Director of the University Library.

Composing the Cornell of the Future

In our campus debates, we need more sustained, reasonable discussion, greater composure, less anger and vituperation. Instead of joining a cacophony of outraged voices, we should compose, out of our harmonies and dissonances, a symphony of humane discourse.

As far as I am concerned, this is our obligation as a center of thought. The reason I think Cornell is especially well suited, among universities, to provide this form of leadership centers on our unique tradition of high intellectual quality and devotion to public service. A university that, early in its history, saw as one of its duties the teaching of reading to farm wives is a university with a private conscience and a public mission. It is a

community that, in its best moments, evinces a spirit almost lost in America -- selflessness.

This is not to suggest that Cornell, of all places, become a bland monolith of like-mindedness. As the currents of Cascadilla and Fall Creek have shaped our campus, the energies of our disputes should continue to shape our intellectual landscape. It is right and proper that we value our differences and that we appreciate both our gorges and the bridges we build across them. But we must ensure that our parts, diverse and disparate and often contentious as they are, compose a whole.

In composing the Cornell of the future, I urge that we reclaim, as our common purpose, the cultivation and improvement of the human mind. I urge that we reaffirm the commitment of our founders: our responsibility to provide moral and intellectual leadership for the nation, not only through our research and service, but also by educating our students for contributions to community.

Hunter R. Rawlings III
Inaugural Address
October 12, 1995

Areas of Focus

Cornell's tenth President, Hunter R. Rawlings III (previously the President of the University of Iowa) and its new Provost, Don M. Randel (formerly Dean of Arts and Sciences at Cornell) have articulated areas of focus for the institution that in many ways are outgrowths of the strategic planning effort:

- 1. Developing better linkages between teaching and research** -- There is a need to find ways to link teaching and research more effectively so that students and faculty both participate in and contribute to the intellectual vitality of Cornell. This includes building better linkages between the academic and non-academic learning environments, in effect building bridges across the full spectrum of student life.
- 2. Creating greater synergy among programs** -- While Cornell's diversity of academic offerings is one of its hallmarks, unnecessary diffusion and duplication of effort among the colleges and academic disciplines need to be brought into equilibrium with the need both to focus resources and more effectively deliver the curriculum. Those universities that can think their way into greater curricular coherence and more collaborative research across departmental and College barriers will be best prepared for the twenty-first century.
- 3. Achieving uniformity of standards** -- The faculty is the single most important asset Cornell has, so there is an increasing need to make investments carefully and in ways that strengthen the totality of the enterprise. Because tenure and promotion standards

historically have varied across colleges, as have the weights placed on research, teaching, and extension activities there is a need to work toward developing more consistent standards concerning the level, quality and distribution of effort required for tenure and promotion and to institute substantive tenure reviews at the Provost's level.

4. Establishing a program review process -- In designing new programs and evaluating current ones, there is a need to take a broad view of our academic strengths and weaknesses, and plan together our future directions. The institution needs to establish a regular practice of reviewing both academic and non-academic programs on the basis of broad standards that can be applied across the university to better inform our decision making.

5. Enhancing the Land Grant focus -- Academic excellence and public mission are joined in a unique and powerful way at Cornell. Nevertheless, if there is an invisible rift down the center of Garden Avenue, roughly separating the perspectives of the endowed and the statutory colleges, it is necessary to plumb its depths. Generally speaking, there is a need to broaden and integrate efforts to engender an appreciation for the role of outreach. Also, it is critical that in ongoing deliberations with officials of both the State of New York and the State University of New York the unique contributions of Cornell on behalf of the State be recognized and appropriately recompensed.

Reaffirming Affirmative Action

Given the renewed controversy about affirmative action generated by the California Board of Regents' resolution to prohibit the consideration of race, gender or ethnic origin in student admissions, hiring and the awarding of contracts, universities across America are reconsidering whether they will continue to act affirmatively in making such decisions. I intend to maintain a strong program of affirmative action and equal opportunity in education and employment at Cornell.

Affirmative action policies have been an effective means of aiding the formerly disenfranchised, including women and protected-class individuals, and they continue to be the best short-term strategy we have to enlarge the pool of talented, hard-working people from which we can draw faculty, students and staff.

Cornell's current policy of equal opportunity in education and employment derives from its founding as an institution where any person could find instruction in any study. In keeping with that philosophy, which has served the university well for 130 years, Cornell will continue to search broadly for candidates for faculty and staff positions and for admission to its student body and will consider not only quantitative measures of achievement but also qualities such as personal integrity, willingness to work hard, and determination to overcome obstacles, which are often even better predictors of success. When two candidates with equally strong

qualifications emerge as front runners for a given position, Cornell will act affirmatively in making its selection. We will provide academic support, student financial aid, and opportunities for personal and career development so that all members of the Cornell community, regardless of their race, color, sex, sexual orientation, age, religion or national origin, can contribute fully to the welfare of the university while realizing their personal and professional goals.

The benefits of affirmative action accrue not simply to the individuals for whom opportunities are expanded, but to the entire university community, which derives much of its vitality from the perspectives of different cultures, races and individual points of view. While neither Cornell nor America has yet realized the full potential of an ecumenical society, I continue to believe that such a society is our best hope for mobilizing the skills and realizing the potential of all our people. Universities like Cornell must take leadership in developing such a society. For all these reasons, I am committed to maintaining an assertive policy of affirmative action at Cornell.

Hunter R. Rawlings III
September 1995

Financial and Physical Development of the Institution

In December 1995, Cornell completed a five-year capital campaign that raised a record-setting \$1.507 billion, exceeding the goal of \$1.25 billion. The \$1.5 billion is the most raised to date in any university campaign and already has helped offset a significant reduction in government support for higher education. The Campaign raised \$630.9 million in gifts designated for Cornell's endowment. That translates to a 91 percent increase in endowed faculty positions (from 130 to 248); a 99 percent increase in endowment per student (from \$38,652 to \$77,078 by June 30, 1995); and a 114 percent increase in the number of endowed student-aid funds (from 1,030 to 2,205).

Nearly \$205 million committed to undergraduate and graduate student financial aid has helped preserve Cornell's need-blind admissions policy and thereby ensured continued access to the state's land-grant university. In addition to student financial aid, the campaign's priorities included support of faculty, academic programs, facilities, and library needs. The campaign raised \$146 million for faculty support; \$589 to support academic programs; \$129 million for facilities; and \$58.6 million for the Cornell Library.

The physical complexion of the campus has also seen changes over the past five years. The \$25.6 million Kroch Library, built underground to preserve central campus greenspace, was completed in 1992. It houses the Cornell University Library's distinguished collections of rare books, manuscripts, and materials on Asia. For the convenience of users, this has brought together the more than 800,000 volumes on East, Southeast, and South Asia which were previously held in a variety of locations.

In 1990, with funding from the state of New York, a \$85.9 million construction and renovation project to bring the College of Veterinary Medicine's facilities up to date with advances in science and technology was initiated. The Veterinary Education Center opened in 1993 and includes two new lecture halls, a state-of-the-art teaching laboratory, and expanded space for the Flower-Sprecher Library. The capstone of the project, the Veterinary Medical Center, will increase the college's square footage by over 70 percent. Upon completion in the Spring of 1996, it will house the new Veterinary Medical Teaching Hospital as well as research facilities and offices for several academic departments.

Also completed during this period was a new \$17.1 million athletic fieldhouse. The facility provides practice and competition spaces for both varsity and intramural sports. The building also houses the Cornell Outdoor Education Program and the Lindseth Climbing Wall, one of the foremost facilities in the world for education and training in the sport of rockclimbing. At 160 feet long and 30 feet tall, it is the largest natural rock indoor climbing wall in North America.

Construction in progress includes a \$20.3 million classroom, office, and library expansion for the School of Industrial and Labor Relations and a \$10.6 million education center at the College of Medicine in New York City. Among the major projects currently in the design phase that will be funded primarily through gifts are a \$38 million renovation and expansion of Sage Hall, which will provide a new home for the Johnson Graduate School of Management and a \$15 million renovation and addition to Lincoln Hall, which houses the Department of Music and the Music Library. In addition, the facilities of the College of Architecture, Art and Planning are shortly to see major capital investments with a \$6.8 million renovation of Tjaden Hall and a \$14.1 million renovation and expansion of Sibley Hall.

Among the other major projects currently or soon to be underway in the Statutory Colleges -- to be funded largely with monies provided by the State of New York -- are an \$8 million renovation of Wing Hall; a \$22 million expansion of Mann Library, to be coupled with a \$16 million renovation of the existing facility; a \$12.7 million renovation of Bailey Hall; a \$10 million new facility to house the Bailey Hortorium; a \$14 million renovation of Stocking Hall; a \$14 million renovation of Riley-Robb Hall; and a \$5.8 million expansion of Martha Van Rensselaer Hall, the home of the College of Human Ecology, coupled with a \$3 million renovation of the existing structure; and a \$13.3 million renovation of existing library and office facilities of the School of Industrial and Labor Relations to complement the expansion project currently underway.

The university is heavily investing in the rehabilitation and renovation of its existing facilities. In addition to the projects listed above, a \$20.2 million safety, heating, ventilation, and air conditioning rehabilitation of Baker and Olin labs, home to the university's Chemistry Department, is currently underway to address environmental and safety issues. Also underway are over \$10.3 million of renovation of Engineering classrooms, laboratories, and library space, as well as \$5.25 million of other classroom

renovations across the campus. Over the next decade, these and similar renovations will address more than \$120 million of deferred maintenance.

One of the more intriguing opportunities facing the university lies in the possibility of cooling the campus by extending the current central chilled water system to a heat-exchange facility at nearby Cayuga Lake, where water would be cooled, then returned to the campus, in a closed loop. Lake water would be returned directly to the lake and never mix with the Cornell chilled water. This project is under active study. If environmental concerns can be fully satisfied and economic projections do not change the project will be started within the next two years.

An instance of "less is more" is the university's Transportation Demand Management Program. This program was implemented in 1990 to reduce the number of faculty and staff vehicles brought to campus. Now in its fifth year of operation, the program has about 3,000 faculty and staff participants. The program utilizes both positive and negative incentives. Positive incentives, for people who choose not to purchase individual parking permits, include an unlimited-use transit pass, or parking discounts and rebates for carpoolers. Negative incentives include increasing parking fees. About 2,400 fewer vehicles than in 1990 are now parking on campus each day.

EVIDENCE OF CONTINUOUS INSTITUTIONAL SELF-STUDY AND PLANNING

Instruction, Academic Innovation, and Assessment

The educational enterprise is clearly the core functional purpose of Cornell University. Over the last five years we have engaged in an extensive period of introspective analysis about both what the institution provides to its undergraduate, graduate, and professional students as well as how that curriculum is delivered. This section will review the work and recommendations of three Strategic Planning task forces that focused on educational matters, describe some of the major academic innovations that have been implemented during the current decade, recount the results of efforts we have undertaken to gauge the effectiveness of a Cornell education, as well as to display some key indicators we utilize to track quantifiable educational trends.

Strategic Planning Task Force on Educating the Leaders of Tomorrow

Some of the more important products of the university's recent strategic planning efforts came out of a task force on Educating the Leaders of Tomorrow that focused on means for improving the undergraduate educational experience (see the May 1994, *Consultation Draft Planning Report and Task Force Reports* for more detail). Above all else this task force recognized that Cornell is unique in combining the best traditions of American private higher education with the best traditions of American public higher education. This results in a rich pattern of intellectual diversity that sets a Cornell education apart from others. Any attempt to homogenize undergraduate education across the entire

University would seriously weaken what is a distinct substantive and competitive strength. Yet Cornell's structure and institutional culture have often emphasized the separateness of its parts at the expense of shared goals. The result can be a failure to define and capture for itself and for its publics the University's unique character and strengths in relation to other institutions. If each of Cornell's schools and colleges operates independently within its own segment of higher education, Cornell remains only one of many competitors in each segment and has no inherent advantage in any. To the extent that each of the schools and colleges sees itself as functioning in relation to the others so as to contribute to the greatest strength of the whole, the University as a whole will be seen to have advantages over competitors in every segment. Integrative mechanisms designed to serve this purpose, furthermore, could help overcome the normal wish of departments and other units simply to grow ever larger.

This led the task force to a vision for the education of all undergraduates at Cornell that should include the following common core of intellectual skills and traits:

- * the ability to write and speak effectively in the expression of disciplined thought;
- * the ability to reason effectively in quantitative and formal terms;
- * the ability to use the analytical tools appropriate to the study of the natural sciences, the social sciences, and the humanities;
- * the ability to engage people of different cultural perspectives;
- * the ability to judge and act on the moral implications of ideas and deeds;
- * the ability to work both independently and in cooperation with others and to exercise leadership.

This intellectual core should be akin to and be complemented by the more specialized preprofessional and professional programs of Cornell's schools and colleges, giving all Cornell undergraduates the ability to integrate theory with practice and preparing them to make worthwhile contributions to society. Cornell should maximize the strength that derives from the intellectual diversity of its schools and colleges by seeking to function institutionally as a multidisciplinary team rather than as a loose aggregation of specialized interests.

Strategies currently in various stages of discussion and deliberation for making reality out of this vision include:

- * Clearly articulating the ways in which the curricula of each of the undergraduate colleges will address these aims.
- * Enhancing the degree to which colleges draw on one another in addressing these aims and eliminating such unnecessary duplications as may exist.

* Giving students in all colleges the experience of serious study in two or more of the other colleges, with the particular aims of experiencing the University's intellectual diversity and bringing about the integration of theory and practice.

* Giving more undergraduates the experience of a senior project incorporating supervised independent work and/or work as part of a small interdisciplinary team.

Strategic Planning Task Force on Graduate and Professional Education

During the 1994-95 academic year, the Strategic Planning Advisory Board charged another task force to review current practices and recommend strategies for improving graduate and professional education at Cornell. In addition to current fiscal conditions, the task force, chaired by Dean of the Graduate School Walter Cohen, identified three trends in the last decade that provided the background for its report and recommendations -- a shifting pattern of enrollment away from graduate research degrees toward graduate professional degrees, changes in financial support for graduate and professional students, and changes in the relative mix of research personnel.

For instance, beginning in 1992, for the first time, entering students in professional masters degree programs (Masters of Professional Studies, Master of Engineering, Master of Industrial and Labor Relations, etc.) exceeded the number of entering Ph.D. students. However, due to the longer duration of Ph.D. programs, there are currently still many more students enrolled in Ph.D. programs at Cornell than in professional masters programs.

The second trend is the changing pattern of funding for graduate and professional students, measured by the number of students supported. In recent years, there has been a large decrease in support funded by the US government from 1,557 students in 1989 to 1,302 in 1994. At the same time, the number of graduate and professional students who are supporting themselves has grown from 699 in 1989 to 1,054 in 1994. The increase in self-supported students is due primarily to enrollment increases in the professional masters programs.

The third trend gives some indication of how research staffing reflects these and other changes. The use of GRAs (Graduate Research Assistants) and RAs (Research Assistants)-- both student designations--has declined from 1,259 in 1989 to 1,084 in 1994 while post-doctoral fellows and research associates -- non-student designations -- has increased from 379 to 444 over the past five years. Because GRA and RA positions are a major source of funding for graduate students, their reduction is a cause of concern. Some of the factors involved may include: the cost of supporting a GRA on a grant (tuition, stipend and overhead) which has increased by 42 percent while the overall growth in sponsored research support to the University rose only by 22 percent; economies in using non-student research personnel (full-time instead of part-time personnel, already trained); and cost of experiments and materials.

From this backdrop, three main themes emerged from the Task Force on Graduate and Professional Education that are being pursued by the University: quality of the faculty, program quality, and the variety of degree options offered at Cornell.

The quality of the faculty has a vital effect on graduate and professional education. The most effective way of improving that quality is by improving the quality of the faculty Cornell appoints. Given the University's high tenuring rate in recent years (at least 63.5 percent)^[1] and the small number of open lines annually available (39 in 1994-95), initial appointments should be conducted with the same seriousness as those for tenure. In allocating, defining, and searching to fill new positions, a University-wide perspective will often help to establish the most pressing needs, identify cross-college joint appointments, and determine the areas where the strongest hires are possible. To strengthen hiring and tenure processes the Task Force made the following recommendations:

1. Standing committees at the college or university levels should be established to advise deans and the Provost on appointments and promotion to tenure.
2. Positions should be broadly defined, so as to produce a larger, more diverse, and stronger applicant pool with the aim of recruiting to not only fill a gap in coverage of a discipline but also to improve the overall intellectual stature of the University.
3. One or two members from ancillary departments, fields or centers should be appointed to search committees whenever there is sufficient overlap between departments to make this appropriate.
4. Deans should whenever possible hold a line open for a department until it is able to recruit a genuinely outstanding person so that departments are able to reopen the search if the pool for a given year does not include the best Cornell could expect to hire.

With respect to program quality, the Task Force noted that the institution's graduate field and special committee structure for graduate study is unique to Cornell. Fields cross department and college lines, and special committees have exceptional power and responsibility for determining the content of individual students' graduate programs. Keeping in mind these unique characteristics, the Task Force made several recommendations for improving the quality of graduate programs. Most prominent among these recommendations was that the Provost should establish a system of periodic reviews for all academic programs at Cornell. In October 1995, the Provost appointed a group of faculty to design the review process.

Because graduate and professional education at Cornell is so diverse and complex, a major effort will be required to create a system that reflects this reality and ensures the widespread support indispensable to its success. In most cases the major benefit of such a review will come from each field turning a critical eye on itself. Should a review indicate that substantial structural changes may be in order, the review process will, in all

likelihood, bring attention to the situation more promptly than is the case now and would facilitate the implementation of such changes at the appropriate level.

For both academic and economic reasons, the evaluation of graduate and professional programs should be part of a larger review process that includes, where relevant, undergraduate education, research, and extension as well as other outreach activities. Similarly, wherever possible reviews should build upon current assessments of quality. Each program should be evaluated regularly (for example, every five to seven years--with 15-20 reviews per year, university-wide). Whenever possible, reviews of allied disciplines should occur at the same time.

To assess contributions from multiple frames of reference, a review structure might include: a group of academic specialists in the same or related disciplines from other universities or from industry or government as appropriate and internal standing committees to provide cross-disciplinary, intra-university perspectives.

In terms of the variety of degree options available at Cornell, the Task Force noted that interactions between changed funding opportunities for graduate education, the scale of research, industry needs, and jobs traditionally available to Ph.D.s have all contributed to a reshaping of the University's graduate programs. These forces, in tandem with a willingness of students to pay for professional masters programs, have led Cornell to establish a variety of professional masters degree programs^[2] beyond those offered in professional schools^[3].

To the extent that professional masters programs are of high quality, responsive to current societal needs and student interest, and bring resources to the University, they are welcome enrichments to the intellectual life on campus. At the same time, Cornell has the responsibility to maintain graduate research programs of the highest attainable quality and especially to graduate Ph.D.s with the training and general ability to make original contributions to knowledge and provide intellectual and other kinds of leadership in society at large and in academia. The Graduate School currently facilitates development and reviews new professional degrees proposed by colleges throughout the university. The review includes a careful evaluation of the potential complementarities between proposed programs, graduate research programs, and undergraduate programs to ensure the quality and viability of proposed and current programs. These activities both reaffirm the University's commitment to high quality graduate research degree programs, particularly the Ph.D. and, at the same time, support the development of high quality professional graduate degree programs. The Task Force recommended that while that affirmation and support should continue:

1. The Dean and General Committee of the Graduate School, in consultation with the colleges, should review current procedures for cooperative oversight of professional programs (those outside professional schools) with the objective of this review to determine whether certain Graduate School procedures hinder, rather than help the operation of such programs and suggest procedural changes where appropriate.

2. The discussion of a necessary "critical mass" of Ph.D. students needs to be pursued at the field and/or departmental level and should be addressed as a factor in academic program review.

Strategic Planning Task Force on the Generation and Application of Knowledge

In the 1993-94 academic year, the Strategic Planning Advisory Board charged the Task Force on the Generation and Application of Knowledge to develop vision statements, goals and related strategies, that address two themes (see the May 1994, *Consultation Draft Planning Report and Task Force Reports* for more detail):

- * use of Cornell's unique strengths to advance its role in research and scholarship;
- * identifying Cornell's strategic publics and how to serve them.

The Task Force met ten times during the year, developing five major vision statements and a series of goals and related strategies that address each vision. From this list, there are ten major recommended strategies that require priority for Cornell to position itself competitively for the 21st century.

The Task Force began its work by developing a set of defining principles to guide its recommendation. These principles include the concept that scholarship of discovery, integration, application and teaching serves to shape our society and that the individual faculty activity in generating new knowledge is fundamental to Cornell's excellence. As such, both research and outreach programs across the entire university are integral components of Cornell's contemporary land grant mission, just as fundamental research and research in strategic areas are both essential to the development of new knowledge. Effectively integrating research, teaching and outreach is central to Cornell's mission. In addition, these efforts must address global opportunities and challenges. The success of this initiative will rest on effective collaboration among academic disciplines and with outside partnerships with other institutions of higher education, industry, governmental bodies and public and private agencies. On-going evaluation is essential to achieve excellence and to determine future investment. The Task Force recognized that planning for university research endeavors must recognize the probability of near-term and possibly long-term financial constraints.

A full discussion of the Task Force findings can be found in their report submitted in April, 1994 to the Strategic Planning Advisory Board (see the May 1994, *Consultation Draft Planning Report and Task Force Reports* for more detail). Recommendations from the Task Force centered around five major themes:

1. Increasing Institutional Quality, Effectiveness and Competitiveness:
2. Forging Strategic Partnerships
3. Serving and Learning from Society

4. Developing Undergraduate and Graduate Students

5. Creating the Global Land Grant University

The Task Force concluded that Cornell's academic diversity is one of its major strengths. The challenge is to attain all the benefits accruing from the interaction of its endowed and statutory sectors, its various colleges and its research, teaching and outreach missions. There is a need to reaffirm the central role of research, innovation, and original scholarship at Cornell and to bring them to sustained, creative interaction with teaching and outreach. The Task Force asserted that the overriding goal of Cornell in the years ahead should be to generate a viable balance and synergistic relationship among research, undergraduate and graduate teaching and outreach programs.

Academic Innovations

Ezra Cornell's vision of "an institution where any person can find instruction in any study" led to the founding of a unique university, and continues to encourage educational innovation. As such, curricular revisions and enhancements are ongoing aspects of improving the educational enterprise throughout Cornell.

A number of major academic innovations have occurred during the first half of the 1990s, with significant curricular restructurings taking place in the College of Human Ecology, the School of Industrial and Labor Relations and the College of Veterinary Medicine. As an example, in the Fall of 1993, the College of Veterinary Medicine introduced an innovative new veterinary medical curriculum, emphasizing an interdisciplinary, tutorial-based approach. Students learn basic biomedical science principles in the context of clinical medicine through structured case-based exercises, supplemented by laboratory sessions, lectures, interactive computer courseware, and independent study. The new curriculum provides greater opportunities for students to develop skills in critical thinking and medical problem solving, in accessing and analyzing information, and in communicating with clients and colleagues.

On a smaller scale and in response to both student feedback and sound educational pedagogy, the College Engineering in partnership with the College of Arts and Sciences has transformed the introductory calculus sequence. Previously taught as a large lecture course in which several hundred students were enrolled, the course is now offered in classes with a maximum of twenty to twenty-five student per instructor to bring about more individualized attention.

In 1990, the Hughes Scholars Program was initiated to increase research opportunities in biochemistry, genetics, cell physiology, and neurobiology for Cornell undergraduates studying in the biological sciences. Funding from a grant from the Howard Hughes Medical Institute enables approximately twenty-five juniors per year to participate in the program which consists of an intensive three-week lab course held during the summer, research conducted in the laboratories of faculty and two seminar series.

Not everything worthy of note has necessarily been introduced during the past five years. In many cases, high quality curricular offerings have been maintained or their offering expanded. The John S. Knight Writing Program is one such program. Nearly all freshmen enroll in at least one of the Freshman Writing Seminars coordinated by this program. Offered by a broad range of departments and programs throughout the university, the purpose of the seminar is to help students write expository prose that is characterized by clarity, coherence, intellectual force, and stylistic control.

Interdisciplinary and research centers play a key role in the education of Cornell students. Over thirty such centers are presently in existence, including several of national scope and stature. The Africana Studies and Research Center, the Center for the Environment, the Center for International Studies, the Cornell Biotechnology Program, and the Family Life Development Center are among those that explicitly focus a significant component of their efforts on undergraduate or graduate teaching and training.

Programs to develop or promote information literacy among students -- in addition to that which happens as a natural component of the curriculum -- are also available. The Cornell University Library has training programs and documentation to familiarize students with various sources of information as well as to instruct them in search and retrieval procedures. All sixteen libraries on the Ithaca campus provide training in bibliographic searches and the use of the on-line catalog. The library system annually conducts more than 500 instructional sessions for more than 10,000 participants.

Recent Survey Research

As a means of assessing general student satisfaction and the gains of an education at Cornell, the university regularly monitors key indicators, collects institutionally specific data, and engages in consortial research that not only provides a sense of how our students view their experience at Cornell, but also provides us with a means of comparing ourselves with a group of peer institutions.

In the early stages of the University's Strategic Planning Process a stakeholder analysis was conducted (for more detail, see IPR, 1993, *Stakeholder Analysis: Survey Project Final Report*). Three related instruments were developed and administered to a random sample of over 3,000 students, staff, and faculty. The majority of students, staff, and faculty reported being either satisfied or very satisfied with their Cornell experience.

Overall satisfaction for students was most positively associated with faculty teaching ability, the quality of peer relationships, and the freedom to shape their own programs. For staff, overall satisfaction was most positively associated with being appreciated by others, being able to speak freely without fear of punishment, and with having opportunities to learn to do their jobs better. Overall satisfaction for faculty was most positively associated with salary, academic facilities, and the quality of working relationships.

**Figure 1. Strategic Planning
Stakeholder Analysis Survey
Current & Ideal Importance of Teaching & Research**

Scale: 1=Not Important, 5=Very Important

All three groups -- students, staff, and faculty -- perceived that dedication to research plays a far greater role in guiding university operations than does either teaching or outreach activities. Nevertheless, all three groups thought that teaching and research should be equally emphasized (see Figure 1). For students and faculty, operationalizing the importance of teaching at a level comparable with research was identified as what should be the University's top priority.

Our primary means of conducting consortial research has been through the Consortium on Financing Higher Education (COFHE), which consists of 32 private colleges and universities. COFHE represents the interests of these institutions in Washington, DC and also functions as an initiator and coordinator for institutional research projects involving its member institutions. During 1990-95 Cornell participated in two such COFHE projects that have provided important information to fuel educational policy deliberations on campus.

The first was the COFHE Class of '84 Follow-Up Survey conducted in 1991, seven years after this cohort graduated (for more detail, see IPR, 1993, *Stakeholder Analysis: Survey Project Final Report*). Thirteen of the thirty-two COFHE institutions participated in this project. One of the most interesting findings of this study was the relationship between overall level of satisfaction with undergraduate education and the likelihood of recommending the college or university to a high school senior with similar characteristics. Of the 13 participating institutions, Cornell ranked first in willingness of alumni to recommend it to high school seniors and ranked 8th in overall satisfaction with their own undergraduate education. It is not readily apparent what to make of this difference. Nevertheless, it suggests that while our alumni feel their experience could have been improved, they are certain they benefited greatly from having completed their undergraduate careers at Cornell.

Other important findings from the Class of '84 Follow-Up study focused on undergraduate instruction. Respondents were asked to rate the importance of 26 educational outcomes in their lives today as well as to rate the amount of gain they received in these areas during their undergraduate education. Data from these items provide information on how well we educate our undergraduates in the areas that they are likely to find most important after they leave college.

With respect to how 26 educational outcomes bear on their lives today, Cornell alumni ranked them in an order of importance closely matching that of alumni at the 13 other institutions. The more generic abilities of analytical thinking, independent learning, writing, self-understanding, etc. head the list. The areas of Cornell's traditional strengths--quantitative skills, science and technology, vocational training--appear to be less important to these alumni. General education and traditional liberal arts were also deemed less important. Thus, relative to the other institutions, Cornell alumni appear to have received the greatest educational gains in areas of less importance to them today. Cornell ranked no higher than 7th on any of the 7 outcomes that 50 percent or more of the Cornell respondents agreed were essential. These findings, while not conclusive, have prompted further consideration and study of the outcomes of undergraduate education at Cornell.

More recently, in 1994, we have surveyed graduating seniors -- again using a COFHE designed and administered instrument (see Hurst, 1995, for more detail). Twenty-seven of the thirty-two COFHE institutions participated in this project, including 14 universities, 8 coeducational colleges, and 5 women's colleges.

One part of the COFHE Class of 1994 survey asked students to rate their degree of satisfaction with a list of services and features of their undergraduate education. These satisfaction ratings were then subjected to factor analysis, a statistical procedure used to summarize a larger set of variables with a smaller number of "derived" variables. The result was that 35 aspects and services were grouped as four factors: social life, academic life, facilities, and faculty/administration.

The Cornell means for all four of the factors were consistently in the middle of the 14 universities in the study. However, it should be noted that the entire range for three of the four factors is above 2.5, which is the balance point between satisfaction and dissatisfaction. Broadly speaking then, these results for both Cornell and the other universities were positive.

Cornell's best showing in terms of student satisfaction was on the facilities factor. The only factor that finds us below the median university was the Academic Life Factor. Table 1 presents the mean satisfaction ratings for the individual items that comprise the academic life factor, how Cornell ranked among the 14 participating COFHE universities^[4] in student satisfaction on the item, and the correlation between the items and overall satisfaction with undergraduate education.

Table 1. 1994 COFHE Senior Survey Academic Life Factor

Cornell's

Item	Cornell's Mean Satisfaction Score	Rank Among the 14 COFHE Universities Participating	Item Correlation with Overall Satisfaction
Overall quality of instruction	3.16	9	.41
Courses in your major field	3.24	8	.40
Contact with faculty/administrators	2.57	11	.34
Availability of faculty Tutorial/other academic assistance	2.89	12	.32
Size of classes	2.92	7	.30
Opportunity to take interdisciplinary courses	2.79	14	.28
Independent study/research opportunities	3.14	9	.25
Humanities and arts courses	3.15	11	.23
Natural science/math courses	3.23	10	.22
Social science courses	2.83	3	.21
	3.22	5	.19

Scale: 1=Very Dissatisfied, 4=Very Satisfied

The fact that all of the means in the table are above 2.50 indicates that for all of these items there was more satisfaction than dissatisfaction expressed by the respondents. A brief inspection of the list suggests several sub-themes within the academic life factor: course quality, contact with faculty, and perhaps academic support. The sub-theme that appears to pull Cornell below the median ranked university is contact with faculty. For example, availability of faculty ranked 12th and class size ranked 14th.

Cornell's position relative to the other COFHE universities on these two items is highlighted in Figure 2. Again, note that all of the universities are in the upper right hand quadrant (greater satisfaction than dissatisfaction for both items) and that class size is highly correlated with out-of-class availability of faculty. Nevertheless, Cornell is not ideally positioned relative to these peer institutions.

**Figure 2. 1994 COFHE Senior Survey
Satisfaction with "Class Size"
and "Out-of-Class Availability of Faculty"
14 COFHE Universities**

Scale: 1= Very Dissatisfied, 4 = Very Satisfied

Subsequent analysis of both internal and available comparator data, however, have indicated that relative class sizes at Cornell are not remarkably different from those found at these other institutions. Thus, it may be that responses on this item reflect another source of student concern that is only indirectly related to class size *per se*. Nevertheless, this information has initiated debate among the institution's faculty and figures into the areas of focus outlined earlier.

Enrollment and Graduation Trend Data

Total enrollment at Cornell over the first half of this decade has been very stable. The number of students at the Ithaca campus has increased 2.7 percent since 1990 from a total of 18,389 to 18,890. [6] While the total number of students has risen only slightly, the mix of students has continued to become more varied, as suggested in the series of figures that follow.

Overall, women have continued to become a slightly larger proportion of the University's total enrollment (see Figure 3). Since Fall 1990 the number of women among the undergraduate population has increased 10 percent from 5,501 to 6,062 in Fall 1995 and in the Graduate School women have increased 3 percent from 1,541 to 1,586. There have been fluctuations in the intervening years, but the number of women in the Professional Schools has increased 11 percent from Fall 1990 (546) to Fall 1995 (605).

**Figure 3. Women as a Proportion of Enrollment
Fall 1990 - Fall 1995**

Enrollments of minority students have also increased between 1990 and 1995 (see Figure 4). In Fall 1990 there were 2,777 minority students among the undergraduates and this number rose to 3,668 in Fall 1995, an increase of 32 percent. Minority enrollments in the Graduate School also increased 28 percent, from 388 in Fall 1990 to 496 in Fall 1995. As well, minority enrollment in the professional schools increased 12 percent from 202 in Fall 1990 to 226 in Fall 1995.

**Figure 4. Minorities as a Proportion of Enrollment
Fall 1990 to Fall 1995**

A look at some of the detail underneath these macro level numbers is instructive. The relative proportion of White students among the total enrollment on the Ithaca campus has decreased 14 percent (12,223 in Fall 1990 to 10,583 in Fall 1995) while Asian enrollment has increased 43 percent (1,816 to 2,604), Hispanic enrollment has increased 32 percent (732 to 967), and foreign student enrollment has increased 20 percent (2,087 to 2,510), as depicted in Figure 5. The early years of this decade saw an increase in the proportion of Black students, but more recently their numbers have been diminishing slightly (754 in Fall 1990 to 733 in Fall 1995), constituting a five-year decline of 3

percent. While this five year time span also saw a 32 percent increase in the proportion of Native American students, their relatively small number (65 in Fall 1990 and 86 in Fall 1995) makes comparable analysis of their changes difficult since small variations in absolute numbers can cause large percentage changes.

**Figure 5. Indexed Change in Total Enrollment
Fall 1990 - Fall 1995**

By far, increases in undergraduate enrollment have had the greatest impact on total enrollment. Since 1990, the enrollment of undergraduates has increased by 571 students - from 12,801 to 13,372 -- an increase of 4.5 percent. Again, the relative mix of students is changing (see Figure 6) with foreign, Asian, Hispanic, and Native American students increasing in numbers, and Black and White students becoming proportionally less prevalent. To wit, the undergraduate enrollment of foreign students increased 80 percent from 438 in Fall 1990 to 790 in Fall 1995; Asians increased 44 percent from 1,559 to 2,244, Hispanic enrollment went up 36 percent from 584 to 797, and the undergraduate Native American student population increased 57 percent from 40 in Fall 1990 to 63 in Fall 1995. On the other hand, Black undergraduate enrollment dropped 5 percent from 594 in Fall 1990 to 564 in Fall 1995, while the proportion of White undergraduates fell 12 percent from 9,064 to 7,960.

**Figure 6. Indexed Change in Undergraduate Enrollment
Fall 1990 - Fall 1995**

Over the same time period, total enrollment in the Graduate School dropped from 4,238 in Fall 1990 to 4,133 in Fall 1995, a decrease of 2.5 percent. Demographic shifts have occurred in this population of students (see Figure 7) with Asian and Hispanic students increasing, total foreign enrollment remaining essentially constant, and decreases occurring in the numbers of Black and White students.

**Figure 7. Indexed Change in Graduate Enrollment
Fall 1990 - Fall 1995**

Enrollment in the three professional schools on the Ithaca campus -- the S. C. Johnson Graduate School of Management, the Law School, and the College of Veterinary Medicine -- increased 4.3 percent from 1,350 in Fall 1990 to 1,408 in Fall 1995 (see Figure 8). There were some shifts in the proportions of individuals from racial/ethnic minorities, most notably an increase in foreign enrollment from 102 in Fall 1990 to 126 in Fall 1995 and a recent jump in Black enrollment.

**Figure 8. Indexed Change in Professional School
Enrollment Fall 1990 - Fall 1995**

With respect to graduation rates for freshmen within six years of their matriculation at Cornell, we have seen a significant increase in this rate from 83 percent for those freshmen who entered in the Fall of 1980 to 89 percent for those freshmen who entered in the Fall of 1989 (see Figure 9). In general, over this time period, there was only a minor difference between the graduation rates of women and men. The combined average graduation rate for women in the eight entering cohorts from Fall 1980 through Fall 1987 was 88 percent; for men it was 86 percent.

**Figure 9. Graduation Rates of First Time Freshmen
Graduating Within Six Years of Matriculation
Fall 1980 - Fall 1989 Entering Cohorts**

When breaking out individual cohort graduation rates along racial/ethnic lines it is clear that all groups saw increases in their proportional rates of graduation over this time (see Figure 10). A gap still exists between the rate of graduation for Native American, Black, and Hispanic students and that of Asian or White students, but this gap has diminished significantly.

**Figure 10. Six Year Graduation Rates by
Racial/Ethnic Group, Matriculating Cohorts
Fall 1980 - Fall 1989**

Enrollment Projections

As of this point in time there are no plans to make major shifts in the total enrollment of the University, nor in the current aggregate numbers of undergraduate, graduate, and professional students. Plans are for undergraduate enrollment to remain as close to 13,000 students as possible, and total enrollment to remain at approximately 19,000.

Staffing Patterns

In response to diminishing revenue streams, Cornell has found it necessary to selectively reduce the size of its workforce. Since 1990, the total workforce of the university, excluding the medical programs in New York City, has decreased 3 percent from 9,307 in 1990-91 to 9,028 in 1994-95. Reductions have been accomplished by way of three strategies: not filling positions that became vacant through natural attrition, early retirement incentive programs promoted by the State of New York among statutory college employees, and layoffs (predominantly, but not exclusively, a statutory college strategy). In addition, as the discussion below indicates, the changes have not been identical among the institution's three primary categories of employees: faculty, academic non-faculty, and nonacademic staff.

Over the first half of this decade the total number of faculty^[7] on the Ithaca campus has dropped 2 percent from 1,617 in 1990-91 to 1,585 in 1994-95. However, over this same time period the number of women among the faculty grew from 258 to 296, which increased their relative proportion among the faculty from 16 percent to 19 percent. The number of minority faculty increased by 20 (net gains of 5 Native Americans, 3 Blacks, 10 Hispanics, and 2 Asians) from 133 in 1990-91 to 153 in 1994-95, corresponding to an increase in the proportion of minorities among the faculty from 8.2 percent to 9.6 percent.

With respect to the academic non-faculty^[8] their total number rose 13 percent from 1,023 in 1990-91 to 1,156 in 1994-95, a net gain of 133 individuals. During this period

there was a net gain of 47 women holding these ranks (465 to 512), which held their proportion among the academic non-faculty essentially constant at 44 percent. There was also a net gain of 53 minorities (122 to 175), that translates into an increase from 12 percent to 15 percent for minorities among the academic non-faculty. Native Americans among the academic non-faculty dropped from 3 in 1990-91 to 2 in 1994-95, but Blacks increased from 26 to 30, Hispanics from 18 to 31, and Asians from 75 to 112.

The total non-academic workforce^[9] at Cornell has seen a 5.7 percent reduction in numbers between academic year 1990-91 when there were 6,667 full time staff on the Ithaca campus to a level of 6,287 in 1994-95. The number of women fell 5.9 percent during this time period from 3,897 to 3,666 (causing the relative proportion of women to drop slightly from 58.5 percent to 58.3 percent), while the number of minorities dropped 20 percent from 444 to 356 (causing their relative proportion among the non-academic workforce to drop from 6.7 percent to 5.7 percent).

The university is aware of these latter reductions and continues its commitment to a diversified workforce. Staffing patterns and employee concerns will continue to be among the issues receiving institutional priority.

Outreach and Service

As New York's designated land grant institution from its founding, Cornell has a rich history of serving society, and New York State in particular. Indeed, its mixture of basic and applied scholarship and outreach programs gives life to Ezra Cornell's vision of a marriage between intellectual inquiry and practical service. Its influence extends far beyond the borders of New York, through programs of national significance and of international importance in many regions of the world, including in particular less developed countries. Its graduates hold positions of responsibility throughout the world.

Outreach is understood at Cornell to be an integral part of the university's mission to promote learning through the discovery, integration, transmission, and application of knowledge. It is a two-way process in which the very practice of outreach provides on-going feedback and input to University research programs, classroom and outreach initiatives.

Cornell's outreach is conducted throughout the world, is carried on throughout the university, and takes a variety of forms, including technology transfer, technical assistance, demonstration projects, evaluation studies, credit and non-credit instruction, informal and non-formal education, distance learning, policy analysis, consulting, as well as community and public service.

Cornell Cooperative Extension

Through a dynamic partnership among local, state and federal partners, Cornell Cooperative Extension -- a joint program of the College of Agriculture and Life Sciences and the College of Human Ecology -- serves as an important door to the University. It

enables individuals and communities to improve their lives through partnerships that put research and experiential knowledge to work. In the last year, with its approximately 1,600 employees, 400 agents, 240 faculty and 60,000 volunteers, Cornell Cooperative Extension has impacted roughly one-third of New York State's residents with its educational outreach programs.

Table 2. Sample Cornell Cooperative Extension Programs

Nutrition Health and Safety

Northeast Network: Food, Health and Agriculture Program

A collaborative educational program between Cornell, Penn State, and eleven other northeast institutions to involve community groups and decision makers in exploring the food system.

Expanded Food and Nutrition Program

Helps low income families improve their diets and stretch their food dollars.

Individual, Family and Community Well Being

School Age Child Care

In collaboration with the New York State Department of Social Services this program provides school age child care workers with help in improving their care for children.

Family Resource Management Program

Helps displaced workers develop survival skills and to make plans for the future.

Children and Youth at Risk

Parent to Parent

Support for teen parents, aims to reduce the rate of teen pregnancy and provide assistance to high-risk adolescents and their families.

Make a Difference Program

A program intended to improve science literacy skills and feelings of self-worth and achievement with culturally diverse youth ages 8-11.

Environmental Protection and Enhancement

Master Composters

Volunteers have set up demonstration composting sites to work with homeowners and groups to establish composting programs.

Point Source

A program to improve the quality of New York State's coastal waters by initiating storm drain stenciling programs.

Economic Vitality

Local Government Programs

Focuses on strategic planning and networking between local leaders and county professionals to help local governments make development decisions and secure educational and technical assistance.

Industrial Technology Program

Working with local business on productivity

improvement and technology transfer.

Agricultural Competitiveness and Profitability

Pro-Dairy

An educational program that helps farm managers improve management skills and analyze their businesses strengths and weaknesses; improving productivity and profitability, and remaining competitive.

Fruit Quality

A program to help fruit producers to improve fruit quality and increase production.

The Cornell Cooperative Extension system, a vital resource of New York State, is respected for its ability "to put knowledge to work." It is valued by individuals, families and communities whether they be consumers, fruit growers, dairy producers, teenage parents, state agencies, local organizations or decision makers or industries. In response to societal, economic, and demographic changes, their programs target six critical issues: nutrition health and safety; individual, family, and community well being; children and youth at risk; environmental protection and enhancement; economic vitality; and agricultural competitiveness and profitability.

In the last few years, the colleges have increasingly recognized the need to integrate extension and research activities in a more effective fashion. One key effort to achieve this goal began three years ago with the establishment of sixteen statewide program committees. These committees have a unique charge to both encourage interdisciplinary work, and to stimulate true application of that research to meet societal and community needs. To facilitate new partnerships, Cornell Cooperative Extension and the colleges' research offices have pooled funds to create a competitive grants program for innovative projects emerging from the sixteen statewide program committees.

Funding to support university extension programs continues to be a challenge. For the most recent fiscal year, county government provided 26 percent of the Cooperative Extension budget; the state of New York contributed 27 percent to the colleges and 3 percent directly to the county extension associations; the federal government contributed 17 percent; the county extension associations generated 9 percent; and grants and contracts generated 18 percent. The budget for the entire Cornell Cooperative Extension system was \$91.4 million in 1994-95. Over the past five years, there has been a modest increase in total funding for the system. Despite this growth of funding, when adjusted for inflation, the purchasing power of these funds has been adversely affected. A review of the trends by source of funding shows modest increases in federal and state funding with modest decreases in county funding. Grants and contracts, traditionally a small part of extension funding and generally targeted to very specific programs, have become increasingly important for program success and will likely grow in importance in the future. The colleges continue to explore new ways to strengthen our effectiveness and capacity to be successful in this arena.

Industrial and Labor Relations Extension

Cornell's Industrial and Labor Relations Extension program exists to disseminate research-generated knowledge and to train union and management leaders throughout New York and the nation in the latest techniques and information related to the field of labor relations.

ILR Extension is funded annually by a core State appropriation along with grants and contracts and fees for educational and technical assistance. In addition to utilizing the expertise of the faculty of the College of Industrial and Labor Relations, ILR Extension has approximately 75 staff located on the Ithaca campus as well as in offices in Albany, Buffalo, New York City, Old Westbury, and Rochester.

Programs are targeted at three groups: unions and corporations with an interest in labor-management relations and human resource management and development; policy makers with interests in employment relations and employment policy matters; and workers with interests in employment relations and employment law. Special emphasis is placed on Labor Studies, Management Training and Executive Education, Programs for Employment and Disability, and Programs for Employment and Workplace Systems. In total, ILR Extension programs annually reach more than 25,000 individuals.

Agricultural Experiment Stations

As the land grant university for New York State, Cornell University discharges its responsibility for research in the agricultural and related sciences through the Cornell University Agricultural Experiment Station in Ithaca and the New York State Agricultural Experiment Station in Geneva. Additional agricultural experiment facilities are maintained in the mid-Hudson Valley at Highlands, at Lake Placid, and on Long Island at the Horticultural Research Center at Riverhead. Other agricultural research facilities are maintained as far west as Fredonia and as far north as Chazy, to investigate growing conditions in the range of varied climates and soils important to New York State agriculture, which remains the state's largest industry.

It is the mission of the experiment stations to provide the knowledge and research base for sustaining agriculture and food production and related activities throughout New York State. These stations also contribute to the national agricultural research program. In addition to operating numerous agricultural research farms throughout the state, the experiment stations also manage the State's Integrated Pest Management Program and the North Country Agricultural Research Program.

Veterinary Teaching Hospital and Diagnostic Laboratory

The Veterinary Medical Teaching Hospital, through its Small and Large Animal Clinics, annually treats more than 15,000 patients, including horses, cattle, sheep, goats, dogs, cats and even exotic animals. Additionally, the Ambulatory Service serves over 400 farms in a 30-mile radius of Ithaca. Board-certified specialists are available in the areas of animal behavior, anesthesiology, cardiology, clinical pathology, dermatology, internal

medicine, neurology, nutrition, ophthalmology, pathology, radiology, surgery, theriogenology, toxicology and zoological medicine.

The Veterinary Diagnostic Laboratory conducts over 700,000 diagnostic tests each year for many species of animals, including humans. It is the State of New York's diagnostic center for animal disease control, the official laboratory for the state of New York, and accredited by the United States Department of Agriculture to perform official tests. It also carries public health accreditation for endocrinology and water testing.

Utilizing four regional labs at Ithaca, Cobleskill, Geneseo, and Potsdam, the Quality Milk Promotion (Mastitis Control) Program, provides diagnostic services to the dairy industry of New York State, supervising bacteriological examination of over 170,000 cows and making more than 3,000 farm visits annually. In addition, the Equine Drug Testing and Research Program, formed in 1971 at the request of the racing industry to prevent drug abuse in the largest spectator sport in New York State -- horse racing. More than 224,000 samples are analyzed annually. Two Poultry Diagnostic Laboratories serve commercial producers of chickens, ducks and turkeys in New York State. Located in Ithaca and Eastport, Long Island, their research and vaccines help to prevent serious outbreaks of poultry diseases.

Cornell University Outreach Council

In March of 1994, the Vice President for Research and Advanced Studies recommended the establishment of the Cornell University Outreach Council. This recommendation, based on the earlier findings of the Strategic Planning Task Force on the Generation and Application of Knowledge, is part of a coordinated effort to bring together separate college, school, center, institute and program outreach activities. The Outreach Council will help to support the notion that educational outreach is a full partner with research and teaching.

Outreach is defined as the sharing and application of knowledge between the institution and society. It provides new knowledge and leadership to catalyze the growth and development of individuals, communities, businesses and the greater society and provides input to the institution *from* society. The outreach effort is normally outside the formal degree-granting process, occurs in a variety of forms and places and is an integral part of the broader University mission.

The vision statement of the newly constituted Outreach Council states that "Cornell will be a university recognized as being among the first rank in the world in integrating research, teaching and outreach functions and functioning as a strategic partner in innovative institutional and program delivery partnerships to enhance the economic vitality, environment and quality of life of individuals, families, firms and communities in the state, nation and world. "

Since the fall of 1994, the work of coordinating outreach has taken place in the Office of the Vice President for Research and Advanced Studies. An executive committee of the

Outreach Council has met a number of times to begin the university-wide initiative. The full Outreach Council will hold its first meeting in early 1996 with the expectation that it will meet semi-annually. The functions of the Outreach Council include the following:

1. Assist in the creation of partnerships internally and provide access to Cornell resources for strategic publics;
2. Identify ways to focus or develop university and program resources; and
3. Strengthen the commitment and recognition accorded by the Cornell community spanning generation, dissemination and application of knowledge.

Each of these functions has a full list of objectives and activities, all of which can be found in the full report, *Proposal to Establish a Cornell University Outreach Council*.

Cornell Office for Technology Access and Business Assistance (COTABA)

In January 1995, the Cornell Office for Technology Access and Business Assistance (COTABA) was formed as the first step in establishing an Innovation Center, a recommendation of the Strategic Planning Task Force on the Generation and Application of Knowledge. The mission of this office is to support entrepreneurship, business creation and innovation and other early stage elements of the commercialization process, thereby contributing toward economic development through appropriate and effective utilization of Cornell resources. COTABA's three fundamental objectives are implicit in from its mission statement: **coordinate** technology access and resource information on campus; **nurture** formative new business enterprises; and **link** to the business community.

Since its founding, COTABA has been instrumental in a number of activities which have encouraged the development of new ventures based on university research. Some of these activities are national in scope, such as the co-sponsoring of a think tank on new venture creation with the Center for Entrepreneurial Leadership Inc. (CEL) of the Ewing Marion Kauffman Foundation and Johnson Graduate School of Management at Cornell. This think tank has spurred a discussion across the United States about the appropriate role of research universities in spawning new businesses.

Locally, COTABA has assisted in the establishment of the Finger Lakes Entrepreneurs' Forum, now with 60 corporate members and a monthly seminar series. It also established a World Wide Web server for COTABA and several offices within Cornell, including the NY State Center for Advanced Technology - Biotechnology, the Cornell Research Foundation, the Cornell Outreach Council and the Office of the Vice President for Research and Advanced Studies. COTABA has also met with would-be Cornell entrepreneurs and provided assistance with business plan development, securing of federal grants, matching technology with management expertise, and planning for seed funding. As part of the effort within Cornell, COTABA is collaborating on technology assessment as part of a team to develop targeted marketing plans and processes for new business attraction and local company retention.

Other Outreach and Service

While the statutory college's extension programs described above may be among the most visible outreach entities of the university, they are by no means the institution's only outreach efforts. For instance, the Herbert F. Johnson Museum of Art is visited each year by more than 30,000 individuals without formal ties to the university. The Johnson Museum's programs for elementary and secondary schools during the 1994-95 academic year provided guided tours of the collections, demonstrations, and workshops to over 5,000 schoolchildren. As well, the more than 100 tours, lectures, workshops, and presentations for adults, families, and children were attended by over 2,000 individuals and more than 30 community groups, including groups of students from 12 area colleges.

In 1991 the university established the Public Service Center to support and coordinate the service and social action initiatives of members of the campus-community. Through its various programs the Center provides a range of services that provide students and faculty with opportunities to connect their academic interests with the broader world community. One program, the Faculty Fellows in Service Program has supported the efforts of over 100 faculty representing all of Cornell's schools and colleges in more than 87 community service projects totaling more than \$150,000. Projects are local, regional, national, and international in scope.

More than 5,000 students annually participate in programs of the Center. Through their involvement in the Center, students experience the rewards and challenges of serving the community. Programs take place locally, regionally, nationally and internationally. As students connect what they are learning on the campus to real world settings, they develop technical and interpersonal skills as well as a better understanding of community necessary to be leaders in a continually dynamic environment.

Another example of outreach and service is the Expanding Your Horizons conference held each fall for over 300 sixth to eighth grade girls and their parents. Designed to stimulate interest in math, science, and engineering, Cornell's Expanding Your Horizons' program consists of a day of hands-on workshops for both the girls and their parents. The conference is run entirely by volunteer graduate and undergraduate students, faculty, and staff from the university.

The Cornell Theory Center, one of four supercomputing centers funded by the National Science Foundation, is also a prominent participant in the university's outreach and service activities. For example, outreach activities for academic and research institutions in the United States are provided through the Smart Node Program. The Smart Nodes are a consortium of universities, colleges, and government research laboratories which distribute supercomputing information, expertise, support, and training to researchers at their sites. More locally, the Theory Center offers workshops for area K-12 educators -- teachers, librarians, computer support staff, principals, superintendents, and school board members -- introducing them to the Internet and the World Wide Web.

The Cornell Institute for Biology Teachers (CIBT) is a five year old effort aimed at improving K-12 biology education. To date, more than 130 high school science teachers have spent at least one summer on campus and continue to interact through an electronic network and through the activities of staff who work with the teachers in their schools. A hallmark of the program has been the production of materials and exercises that can be used directly in the schools. Personal support is provided through an extension associate and, in collaboration with the Biotechnology Program, a lending library of supplies and equipment. A middle school project, which includes a broader spectrum of science than just biology has recently been introduced. Coordinated by the Division of Biological Sciences, CIBT is among the largest outreach efforts sponsored by the Howard Hughes Medical Institute. In addition, funding for the program is also provided by a series of small private foundations, support from industry, and from the State of New York.

Information Technologies

Infrastructure Development

In a very short time period -- four years -- the change in information technology on the Cornell campus has been significant and the effect has been dramatic. In 1991, there were 6,000 traditional timesharing accounts on campus, serving under 50 percent of the faculty, 25 percent of the students, and 10 percent of the staff. By October 1995, 95 percent of the faculty, almost 100 percent of the students, 90 percent of the staff, as well as a portion of the institution's alumni were active users of the array of information technologies available on campus.

During the past five years, the campus achieved a critical mass of basic network connectivity including approximately 16,000 standard connections on the Ithaca campus. All 6,000 residence hall rooms on campus are wired as are most faculty and staff offices. With the completion of wiring in the residence halls during the summer of 1995, a third of the students living on campus have activated their network connections. Members of the campus community can also utilize almost 500 dial-in ports from on- and off-campus locations.

The expansion of the physical network has been accompanied by a fundamental transition from a mainframe-based time-sharing model of central computing to a distributed client-server computing framework. Sixty-six percent of all undergraduates surveyed in 1995 reported owning workstations, up from 48 percent reported in 1992. Student access to information technology has also been enhanced through the development and deployment of additional public computer laboratories in the residence halls and the libraries.

A broad base of networked workstations replacing centralized mainframes has required development of distributed software applications. The Mandarin Project, based at Cornell, has provided a suite of development tools which have been used to create distributed applications for students, faculty, staff, and administrators. One by-product of Mandarin technology, the Bear Access suite of software, gives campus users a flexible, easy-to-use interface for connecting to a set of distributed resources. Easy access to

traditional terminal emulators ensures that access to information is not limited by the ability to purchase the newest equipment.

Use of the Infrastructure

In this environment, many traditional central service providers are transforming themselves to take advantage of the newly networked campus.

Libraries -- Over 100 Macintosh-based kiosks in Library buildings (as a supplement to general access from any networked location) use Bear Access software to make a vast collection of bibliographic information available. Collaborative projects expected to have a significant impact in the not too distant future include a pioneering effort to both preserve and electronically distribute books across worldwide computer networks; a closely allied project, aimed at using the Internet to create a distributed printing environment for high-quality documents; and an effort to digitize and electronically distribute primary source material on American history.

Student Services -- Traditional student services are changing. *Just the Facts* gives students on-line access to grades and financial aid information, as well as allowing them to change their addresses. As a result, walk-in traffic at the Registrar's office has been reduced, and lines are much shorter. *Faculty Advisor* captures information for faculty about their advisees and will augment personal counseling sessions with accurate, shared, information. *Student Jobs/Internships* has provided students with a quicker and more thorough method for locating employment opportunities. *Resume Express* captures student resumes as image files, uses an expert system to match resumes to employer criteria and sends resumes to interested employers by fax.

Research -- The Cornell Theory Center (CTC) is one of four National Advanced Scientific Computing Centers established by the National Science Foundation. It is actively supported by NSF, the Advanced Research Projects Agency (ARPA), the National Center for Research Resources at the National Institutes of Health (NIH), NY State, and its corporate sponsors. The Theory Center's resources have been used by more than 5,000 researchers in fields as diverse as aerospace engineering, economics, and epidemiology. Its staff offers technical expertise in software, visualization, and parallel processing, and investigates new, highly parallel processing resources for the scientific community. A variety of education and training programs are also offered to high school, undergraduate, and graduate students, and their professors.

Collaboration and Information Sharing -- One of the more visible impacts of distributed computing on the campus has been the explosion of World Wide Web servers. At Cornell, the Web is rapidly becoming a primary vehicle for institutional, and to some extent personal, information sharing. The CUINFO Web server is a comprehensive doorway to this rich environment (<http://www.cornell.edu/>). It is a starting point for exploring almost all campus resources and activities, including links to most other Web/Gopher servers on campus, and in the local Ithaca community.

Instructional Services -- Applications like electronic mail, news groups, and the World Wide Web have provided faculty with an easy way to share information with students. At least 40 classes on campus are using mail list discussion groups as an integral part of the curriculum, and some faculty are experimenting with lists as a vehicle for expanding the traditional practice of office hours.

The Cornell University Instructional Web Server is a pilot project designed to assist faculty in exploring the use of the Web in their courses, including an increased ability to direct students to resources beyond the confines of the campus. More faculty use the Web in instruction each semester -- offering students a new environment in which to obtain course resources (substantive and administrative) and to collaborate with each other.

Outreach -- Cornell, as a land-grant institution, has an explicit outreach mission, and improved network access has improved the University's ability to fulfill its outreach goals. One example is the Cornell Extension Network (CENET), which is a dial-in electronic mail and bulletin board system allowing Cornell Cooperative Extension agents, other specialists, faculty, and staff to share information with clientele from around New York State. Links between CENET and the newly expanded campus net have allowed access to a much broader set of resources than previously available.

A different level of outreach and collaboration is made possible by CU-SeeMe -- a real-time desktop videoconferencing program (including audio) developed by Cornell staff with financial support from the National Science Foundation, and available at no charge. Cornell faculty have already used it to give lectures around the globe without leaving their offices. The Cornell College of Veterinary Medicine has used CU-SeeMe for instructional purposes, broadcasting surgery "live" to remote sites.

Future Plans

College-level Information Technology Planning and Support -- Given the size, scope, and growth rate of information technology use at Cornell, a model based on centrally provided support delivered directly to end users is not practical. Ultimately, the usefulness of the information technology for faculty, staff, and students is best achieved by a collaborative effort between Cornell Information Technologies and trained local support providers who are thoroughly familiar with departmental applications, network and workstation configurations, and users.

The development of a distributed support model can only proceed with the help of college-level agents responsible for information technology. Placing these agents in the colleges and collaborating with them to develop plans to address the technology needs of each department is a challenge Cornell needs to face in the near future.

Although most faculty and students have access to computers, many find it difficult to finance the regular updating of equipment to gain the speed and capability needed to run rapidly changing operating systems and applications. Developing college level strategies for acquiring the equipment needed to meet the needs of faculty in teaching and research

is a principal challenge for central and college planners. As well, strategies to assist students in acquiring and accessing appropriate levels of technology is needed.

Infrastructure Development -- Although great strides have been made in network connectivity over the past five years, we are still not able to provide the same level of service to off-campus users as to those in offices and residences on-campus. Since half of Cornell's students live off-campus and many faculty and staff want high-speed, high-volume network access from home, this is an area where infrastructure must be provided over the next few years. Engineering staff are experimenting with wireless technologies to serve the areas immediately off-campus. Cornell staff are also working jointly with telecommunication providers and with the local cable provider to explore means of improving service in innovative ways.

Administrative Systems -- Information technology in parallel with process reengineering offers opportunities to improve campus operations, provide better service, increase efficiency, and facilitate good decision-making. Over the next five years, Cornell will use a three-pronged strategy to address development and replacement of administrative systems.

Information Access -- Students, faculty and administrators need easy access to information to help them plan, schedule, advise, grade and receive grades, report on progress, and carry out many other activities of academic life. Cornell will continue to capitalize on locally developed Mandarin tools and incorporate applications of ubiquitous Web technologies to provide meaningful access to the billions of bytes of data encompassed in legacy and new administrative systems. Much progress has resulted from using applications like *Just the Facts*, *Faculty Advisor*, and *CoursEnroll*. The concepts that have made that progress possible now need to be applied to broad areas such as transaction input and forms applications.

Decision Support Systems -- Structured, defined, standardized data are the foundation for good decision support systems. Cornell cannot claim distinction in this area, as systems and the data that goes with them have sprung up in offices throughout the university. Prototype data warehouse applications have been successful and now need to be expanded and readied for production use. Data warehousing will provide a focus for data administration, and through ad hoc end user query and reporting tools will provide more timely and accurate information to support decision making throughout the university.

Core System Replacement -- Cornell's core administrative systems are based on old technology -- technology that requires programmers versed in mainframe database and transaction languages. Although tools provided by Project Mandarin have allowed easier access to mainframe-based data for students and faculty, it is time to provide administrative systems that align with the technologies faculty, staff, and students have become accustomed to.

Over the next three years Cornell plans to work with PeopleSoft, one of the few software developers providing a suite of university administrative systems, to replace core

administrative systems with systems that will be easier to use and will provide a base from which re-engineering of key administrative processes can proceed. The five systems to be replaced are Student Information, Human Resource/Payroll, Financial, Sponsored Programs, and Development.

Student Services -- For the first time in the fall of 1995 all students used *CoursEnroll* to select their classes for the next semester. The goal of on-line enrollment is, by the end of each semester, to provide students with the list of classes they will be taking the next semester. Meeting this goal not only permits students to plan more effectively with their advisors, but it also provides information for the college Deans about course enrollment at a time when they can use it to make decisions. Automating the course-balancing distribution method, an enhancement planned for course enrollment, will greatly reduce the staff time and effort that currently go into manual course-balancing and scheduling. The Grand Course Exchange, a physical gathering of students who want to change their class list, will be less needed, if not eliminated entirely.

Cornell is working with the College Board on EXPAN, an on-line process for application to college. Although an entirely paperless application process is probably not feasible, many high school students have access to electronic mail and the World Wide Web and prefer composing and communicating electronically.

One of Cornell's strengths is the number of opportunities for study abroad. Leaving the environment on the Ithaca campus, where electronic mail, on-line student services, electronic library and information access are everyday parts of academic life, can be problematic. Over the next few years Cornell plans to further the objective of providing information technology service anytime, anywhere by installing Bear Access and providing network connection in Cornell offices across the world so that students studying in London or Paris or Milan can enroll in classes at the same time -- and use the same tools -- as their classmates in Ithaca.

Libraries -- The Cornell University Libraries are in the process of working with vendors who have, or are expected to have, distributed systems that they are marketing to large research libraries. The goal is to replace the current mainframe-based library system within the next two to three years. While the current system has served a number of university libraries across the country well, its continued maintenance and development have been uncertain, and its mainframe base does not provide the flexibility and ease-of-use offered by distributed systems.

Instructional Technologies -- Until recently, technology has not lived up to the expectations of technologists in increasing the effectiveness or efficiency of instruction. The eager acceptance of the World Wide Web as a way of sharing information with students has led to greater faculty involvement with instructional technology than ever before. Infrastructure and support will be required to help faculty build from the Web base which has proved so useful.

Funding -- At a time when universities are called upon to stabilize tuition levels and decrease costs, the institution is also faced with the need to provide adequate, ubiquitous access to network services and support in the use of these services. The principal challenges are coping with the explosion of use by students, assisting faculty in applying technology in their teaching and research, and providing the level of technology on every desktop that will support the efforts of the students, faculty, and staff. The continuing development of a robust funding model that will result in an equitable distribution of technological resources, and allow the university community to benefit from advances in technology is needed.

Institutional Management

While Cornell has not been immune to the financial pressures facing all of higher education, the institution continues to be fiscally sound. For the eighteenth consecutive year, Cornell ended the 1994-95 fiscal year having spent less than the total of revenues received during the year.

**Table 3. Changes in Fund Balances
(dollars in thousands)**

	1990	1995	Change
	-----	-----	-----
Current funds	\$203,330	\$263,315	\$59,985
Plant funds	1,061,019	828,312	-232,707
Endowment and similar funds	926,896	1,475,576	548,680
Living trust funds	58,153	93,592	35,439
Student loan funds	44,700	55,133	10,433
	-----	-----	-----
TOTAL	\$2,294,098	\$2,715,928	\$421,830

In other words, Cornell has sustained a strong financial position from which to carry out its operations (see Table 3). Fund balances as of June 30, 1995 were up nearly \$422 million from five years previously. Most of this growth is attributable to the capital campaign, discussed earlier, which was specifically promoted to "re-endow" the university as a hedge against difficult financial times.

As can be seen from Table 4, while the magnitude of Cornell's major revenue streams has increased, in general terms the relative proportion that each contributes to the total has not changed dramatically over the last five years. Nevertheless, this does mask at least one significant trend that is causing serious difficulty for the statutory colleges. In 1990, direct State operating appropriations to Cornell (which exclude fringe benefits and funds dedicated to capital projects) totaled \$125.3 million. In 1995, this figure had increased only 3.8% -- well below the rate of inflation over this five year period -- to \$130.1 million.

**Table 4. Current Fund Revenues
(dollars in thousands)**

	1990	% of Total	1995	% of Total
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Tuition and fees	\$218,247	21.5%	\$303,023	22.2%
State appropriations	125,337	12.3	130,061	9.5
Federal appropriations	16,940	1.7	19,698	1.4
Public grants and contracts	211,332	20.8	283,086	20.8
Private gifts, grants, and contracts	107,172	10.6	142,726	10.5
Investment income	58,932	5.8	65,289	4.8
Sales and services	90,614	8.9	117,616	8.6
Medical faculty practice plan fees	130,180	12.8	199,435	14.6
Gain (loss) on investment	(920)	(0.1)	2,783	0.2
Consolidated subsidiaries	9,547	0.9	12,591	0.9
Other sources	49,046	4.8	88,939	6.5
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TOTAL	\$1,016,427		\$1,365,247	

New York State support for higher education has eroded significantly over the last five years. Operating support for Cornell's statutory colleges has been particularly hard hit, resulting in periodic wage freezes, position eliminations, and administrative consolidations in those units. Over the five year period, operating support for the statutory colleges has grown only 7.6 percent, representing increased costs such as salary programs and utilities offset by substantial budget reductions. Since July 1988, when a virtually uninterrupted series of state budget reductions began, the statutory colleges have lost \$21.6 million and over 300 state-funded positions (through July 1995). State-sponsored early retirement programs helped to cushion the impact of these changes, but the funding situation has remained extremely tight. Unrestricted institutional support (Bundy Aid) for the endowed colleges has declined by more than two-thirds during this period, and Tuition Assistance Program (TAP) awards for New York State residents attending Cornell have also declined, placing additional pressure on institutional financial aid budgets.

Federal funding for grants and contracts, primarily from the National Science Foundation and the National Institutes of Health, generally grew in line with inflation during this period and increased slightly as a percentage of the overall institutional budget. These "discretionary sector" expenditures remain significantly vulnerable at a time with the President and the Congress are determined to reach a balanced budget within the next seven years. The relative share of the overall institutional budget that publicly-supported grants and contracts represent has remained constant for the past five years. Federal support for student aid withstood vigorous attacks in 1995, and we remain optimistic that student aid will continue to receive at least level funding in the years ahead, although declining as a share of funds available to support the university's overall financial aid budget.

With respect to expenditures, again there was not a major shift in the proportions of how funds were used between 1990 and 1995 (see Table 5). The most significant changes in expenditures were in research and scholarships and fellowships. There was a decrease in the funds committed to research from about 24% of total expenditures in 1990 to slightly less than 21% in 1995. This reflects the federal government's efforts to reduce its support for both the direct and indirect costs of research. Over the last five years Cornell's federal indirect cost recovery rates have been reduced through federal efforts to cap rate components, to disallow certain categories of costs, and to shift costs to functions other than research.

**Table 5. Current Fund Expenditures
(dollars in thousands)**

	1990	% of Total	1995	% of Total
Educational and general				
Instruction	\$177,495	19.1%	\$246,297	19.5%
Research	224,592	24.2	263,666	20.9
Public service	62,163	6.7	67,932	5.9
Academic support	58,953	6.4	72,756	5.8
Student services	33,305	3.6	45,424	3.6
Institutional support	72,694	7.8	93,202	7.9
Operation and maintenance	57,038	6.1	81,655	6.5
Scholarships and fellowships	52,034	5.6	81,815	6.5
Medical faculty practice plan	127,278	13.7	184,822	14.6
Medical services	na	na	40,486	3.2
Subtotal E and G	\$865,552	93.2%	\$1,178,055	93.3%
Enterprise/service operations	\$52,573	5.7%	\$66,695	5.3%
Consolidated subsidiaries	\$10,323	1.1%	\$13,592	1.1%
Annual unfunded postretirement benefit cost	na	na	\$4,657	0.4%
TOTAL	\$928,448		\$1,262,999	

Expenditures for scholarships and fellowships, however, increased from \$52 million in 1990 to \$81.8 million in 1995. The use of unrestricted resources for undergraduate financial aid continues to outpace the growth in tuition, but in the most recent years we have been able to limit the absolute rate of that growth to single digits. Four non-mutually exclusive variables have led to this increase: growth in student costs, primarily tuition; increases in the number of needy students; a decline in the ability of families to share in the cost; and decreasing availability of government funding.

When looking at a longer period of time, the trends evident in the previous discussion become even clearer. The last twenty-five years have seen major changes in the sources of financial support for Cornell. In 1970, Cornell received more funding from state appropriations (slightly more than \$35 million) than from any of the other three primary

revenue streams: tuition (\$29 million), sponsored research (\$35 million), or gifts (\$26 million). By 1995, each of these other sources far exceeded the state appropriation, *even when adjusting for inflation*: tuition (\$80 million); sponsored research (\$73 million); gifts (\$52 million); and state appropriations (\$35 million). In fact, tuition has become the institution's single largest source of revenue, comprising 30 percent of all revenue at the Ithaca campus.

Hence, difficult choices perpetually face Cornell's decision makers, as they seek a balance between legitimate calls for resources to fulfill the institution's educational mission and making sure this is done with fiduciary responsibility. There is a commitment to ensure that sound educational policy and practice, rather than bookkeeping conventions, drive decision-making.

To help meet this challenge, as well as to respond to calls from the 1991 reaccreditation site visit team and our own strategic planning process for more widespread engagement of the deans in institutional decision making deliberations, a Budget Planning Group was formed in 1994. The Budget Planning Group exists to deal with university-wide budget and planning policies in advance of developing detailed budgets or allocations. The group meets monthly throughout the year, is chaired by the Provost, and has the following membership:

- * One Dean from the statutory colleges (Agriculture and Life Sciences; Human Ecology; Industrial and Labor Relations; and Veterinary Medicine);
- * One Dean from the designated ("tubs" on their own bottom) colleges (Johnson School of Management; Law; and Hotel);
- * Two Deans from the endowed general purpose colleges (Architecture, Art, and Planning; Arts and Sciences; and Engineering);
- * Two faculty nominated by the Faculty Council of Representatives;
- * Senior Vice President;
- * Vice President for Academic Programs, Planning, and Budgeting;
- * Vice President for Student and Academic Services; and
- * Vice President for Facilities and Campus Services

To provide guidance for the institution's physical and capital planning a similar group exists, the Capital Funding and Priorities Committee. This committee meets monthly to review proposed construction, rehabilitation, and renovation plans for the campus. Its membership includes:

- * President;
- * Provost;
- * Senior Vice President;
- * Vice President for Academic Programs, Planning, and Budgeting;
- * Vice President for Facilities and Campus Services
- * Vice President for Public Affairs;

At the end of 1995, a proposal for a major restructuring of faculty governance was overwhelmingly and enthusiastically endorsed by both the faculty and the administration. The creation of a Faculty Senate replaces the Faculty Council of Representatives (FCR) that was formed 25 years earlier. The Senate embodies four major changes:

1. The representative structure of the Senate is department-based rather than college-based. The rationale for this is that representatives elected by colleges do not really work as representatives because they do not have a good enough sense of who it is they represent since the basic structure of faculty in a university is the department. Each department elects one faculty member to the Senate, and departments larger than 25 tenure track faculty elect an additional faculty member to the Senate.
2. A University Faculty Committee (UFC), elected from the Senate by the faculty at large will be established. The central administration, and in particular, the Provost and the President, will look to the UFC for advice and consultation on all major policy issues that are of interest to the faculty. To facilitate that advisory and consultative relationship, the Provost and/or the President will meet on a regular basis with the UFC.
3. The President, Provost, and other senior university administrators have agreed to choose half of the faculty members that they appoint to all search and policy-making or policy advisory committees from a list of nominees provided by the Senate. The Nominations and Elections Committee, which will be elected by the faculty at large, prepares the list of nominees and presents it to the Senate.
4. The Dean and Secretary of the Faculty, the Faculty Trustees, the nine at-large members of the Senate, and the members of the University Faculty Committee and the Nominations and Elections Committee are will be directly elected by the entire faculty. Other faculty members of administration and faculty committees will be selected by the Senate upon nomination by the Nominations and Elections Committee.

These changes are designed to correct many of the deficiencies in the FCR structure that inhibit effective faculty participation in university level governance. Rooting the Senate in academic departments will tie that body more closely to the faculty at large, and the formation of the University Faculty Committee will facilitate closer communication between the administration and the Senate. Since much of the input of faculty to decision-making takes place through ad-hoc committees, it is important that the members of those committees are representative of the faculty. The provision for sharing the responsibility for appointing faculty members to all major committees provides a mechanism for bringing that about.

STATUS OF 1991 SELF-STUDY "AREAS OF SPECIAL EMPHASIS"

In preparation for the 1991 reaccreditation site visit, Cornell University prepared a "comprehensive with special emphases" self-study report. The first area of special

emphasis analyzed the relationship between the endowed and statutory colleges and how that relationship could be improved to enhance the educational, research, and service functions of the university. The second area of special emphasis studied issues related to sustaining and strengthening the university's research effort in a national environment where support for small science may be waning. Finally, the self-study explored means for integrating the social and intellectual experience of undergraduates in ways that extend undergraduate education beyond the classroom.

Much of what has been discussed earlier in this document touches on follow-up that has taken place in these three areas of special emphasis. In the sections that follow, commentary is provided about additional aspects of these areas of special emphasis.

Interaction of the Endowed and Statutory Colleges

Accessory instruction -- the instruction provided to students enrolled in one college by the faculty of another college at Cornell -- is a long-standing financial issue for internal resource management and between the university and the State University of New York (SUNY). The costs of such out-of-college instruction are calculated annually and then resources are exchanged to cover net costs between the statutory colleges (Agriculture and Life Sciences; Human Ecology; Industrial and Labor Relations; and Veterinary Medicine), each of the designated colleges (Johnson School of Management; Law; and Hotel), and the endowed general purpose colleges (Architecture, Art, and Planning; Arts and Sciences; and Engineering). Within the endowed general purpose budget, positive or negative net accessory instruction costs for a college are reflected in the core resources assigned to the college.

Because of refinements in both the way joint programs -- such as the Division of Biological Sciences -- are apportioned between the statutory and endowed colleges, and in costing algorithms, coupled with some changes in student instructional patterns, the State -- through SUNY -- has not fully covered the net costs of accessory instruction incurred by students in the statutory colleges for some time now. While the State has a long-term commitment to fully fund its accessory instruction costs, tight State budgets have prohibited this in recent years. As a result, increasingly the statutory colleges are being asked to cover these charges out of their own local budgets.

Two other major issues come into play throughout the university with respect to accessory instruction -- in both the endowed and statutory colleges. First, in an effort to avoid incurring accessory instruction charges, colleges sometimes limit the number of courses their students can take out of college, sometimes create courses that are similar to courses offered elsewhere in the institution, and sometimes create courses based on their potential popularity and economic return rather than their academic merit.

Second, to minimize the incentive of individual colleges to maximize their income from accessory instruction, constraints are now being applied to several professional colleges on the rate at which they can earn accessory instruction income.

In increasingly tight financial times, ways must be found to reform the accessory instruction system to enhance collaboration across colleges in the delivery of core university courses. This is being addressed along three fronts -- the development of a new costing model, negotiations with SUNY concerning more realistic payments to Cornell for services provided, and pilot efforts underway in several social science fields to enhance cross-college collaboration.

In 1991 Provost Malden Nesheim appointed a Committee on Accessory Instruction to review a series of issues related to the costing of accessory instruction, related resource allocation policies, and academic objectives to be supported. The last major study of accessory instruction had been completed in 1977. The 1991 committee issued its report in June 1993 (see Accessory Instruction Final Report) and a Technical Committee was immediately appointed to develop a new costing model for accessory instruction.

In April 1994, the Technical Committee issued an implementation plan proposing a new costing model, consistent with the Provost's Committee recommendations. After discussions with the academic deans, the Provost selected Technical Committee participants to proceed with implementation of the new costing model. By June 1995 development progressed to the point that the 1993-94 costs could be restated in the new model.

When the full new costing model is applied -- including conforming the costing to newly standardized university costing algorithms (consistent with those for indirect cost recovery calculations); utilizing student course counts rather than credit course as the costing unit; and spreads costs on a complex curve related to course size -- the statutory deficit in accessory instruction increases from \$1.4 million (under the old model) to \$3.5 million. This so-called "course-curve" approach most fully realizes the objectives of the Provost's Committee recommendations. However, it depends on automated data system changes that are non-trivial. Accordingly, the Provost presented an implementation plan to the academic deans in June 1995 that proposed applying all of the improved costing methods, except for retaining college-specific credit hour rates (for the time being).

The summer and fall of 1995 saw Cornell officials engaged in a process necessary to renegotiate funding arrangements between the State of New York, SUNY, and Cornell (see the earlier section on Institutional Management for more detail) Those discussions will ultimately need to address the matter of accessory instruction.

As well, during the summer of 1995 a process to bring together faculty in cross-college fields such as economics, psychology, sociology, and statistics was initiated-- in part -- to begin to address the delivery of the curriculum in these fields in order to mitigate the historical practices that have led to some of the accessory instruction imbalances.

Science and Technology

As noted in the Strategic Planning Task Force on the Generation and Application of Knowledge (see *Consultation Draft Planning Report and Task Force Reports*, 1994), the

university must preserve and enhance quality, competitiveness, and financial stability. It must be done so in a time when there is a decline in the climate for the support of research -- particularly that of a fundamental nature -- when there is a continuing erosion of public trust in research universities, and when public expectations that the results of research and scholarship conducted by universities should be immediately relevant to society's needs. As well, this is a time when the rapidly escalating costs of conducting fundamental scientific research, the increasing demands of other societal needs on limited governmental resources, the heightened competition from other colleges and universities for research and outreach funding, and the increasing internationalization of our environment are also at play.

Yet, in spite of these environmental pressures, Cornell ranks among the top ten research universities nationally, and operates seven national research centers, more than any other American university. Research expenditures totaled \$331 million in fiscal 1994, and Cornell principal investigators rank among the most effective and productive in the nation. The success ratios of competitive research proposals to the National Science Foundation and the Department of Human and Health Services, which support 80 percent of Cornell's federal research expenditures, have remained relatively constant at 45 percent and 40 percent respectively over the last five years.

A fundamental strength of research at Cornell is an interdisciplinary "culture." Stimulated by a graduate education system that promotes cross-disciplinary interactions among faculty and students, a need to share expensive and specialized research facilities, and federal and state programs specifically designed to promote university/government/corporate cooperation, Cornell has developed a rich variety of interdisciplinary research units. This strategy has served Cornell extremely well, both in the vitality of its research and scholarship and its ability to compete for external funding. As the complexities of our society continue to increase, generating equally complex problems to be addressed, the need for interdisciplinary collaboration will increase. Our separately organized centers, institutes, programs, and laboratories provide Cornell with a significant competitive edge compared to many of our peer institutions.

Predictions of dramatic change for our research universities are common today. Major issues include the recovery of indirect costs, conflict of interest, allegations of scientific fraud, intellectual property management, balance between research and teaching, loss of fundamental academic values and standards, strategic research replacing fundamental research, loss of congenial, shared decision making between faculty and administration, and erosion of public trust. A general decline, both real and perceived, in the climate for support of research has heightened debates over big versus small science, merit review verses geographical equity, and the balance between military versus civilian research.

The ever-expanding frontiers of research and scholarship, the increasing tendency toward specialization, and the spiraling cost of scientific instrumentation all place limits on the reach of individual institutions like Cornell, creating a premium on institutional collaborations and partnerships. Comparable pressures for cooperative efforts apply to the outreach mission.

Student Services

Both organizational structure and programmatic initiatives have been undertaken since the 1991 reaccreditation site visit to enhance the institution's delivery of student services to both undergraduate and graduate students. In addition to the programs described previously in this document, three other initiatives are of note.

First, in July of 1994, the position of Vice President for Student and Academic Services was created. Previously, there had been a Vice President of Academic Programs and Campus Life, but with the return of the incumbent to the ranks of the faculty, the administration created a chief student affairs position, reporting to the Provost, with responsibility for areas such as the Career Center, the University Registrar, Office of Instructional Support, the Dean of Students, Housing, Dining, and Public Service. The responsibility for academic programs such as the Cornell Institute for Public Affairs, the Cornell-in-Washington Program, the three Reserve Officer Training Corp programs, the Cornell University Press, and the Johnson Museum of Art were shifted to a newly titled Vice President for Academic Programs and Planning position.

In July of 1995, the responsibilities of the Vice President for Student and Academic Services were expanded to also include the Department of Athletics and Physical Education and the University Health Services. As well, the position now reports directly to the President.

Second, under the leadership of the Dean of Students -- who is a tenured member of the faculty -- the development of a common freshmen experience program has been undertaken. A pilot of the first year experience program will be launched in the Fall of 1996 within the residential program, which is under the purview of the Vice President for Student and Academic Services. It will be designed in collaboration with current faculty fellows to build bridges between the academic and non-academic lives of students. The program will build on an already existing infrastructure of staffing and programmatic support within Campus Life and focus on small group experiences for students across residence hall boundaries and actively include faculty and staff. Current thinking is that the program will be tested in six sites across campus.

Third, a Residential Communities Committee comprised of students, faculty, staff, and alumni was established at the request of the university's Board of Trustees in part to respond to questions concerning Cornell's program houses and their effects on the campus community. The committee's charge was to develop ways to ease the transition to Cornell and generate a greater sense of community at all levels of campus life.

The final report of the committee, issued in January 1996, recommends that Cornell continue to guarantee housing to all freshmen; that faculty actively be engaged in the life of the residence halls; and that the university develop a program that allows students to become members of smaller communities in their first year. The committee recommends that all students share the experience of being members of smaller residential

communities in their freshman year. Each of those communities, the report suggests, should:

- * Have some upperclass students to act as mentors and leaders in the living unit;
- * Be small enough in size so that a supportive community can exist;
- * Have a governance structure and program in which students are invested; and
- * Have faculty who can help mentor students and build community and links to the academic life of the university.

Further, the report suggests that students be allowed to choose such communities from among those closely linked to academic programs, such as program houses; from theme houses; or from those that have the elements listed above but no programmatic focus. The report stresses the importance of links between academic life and residence life and recommends that both the Dean of Students Office and Campus Life be closely involved in residence life and in programming for freshmen during orientation and throughout the year. The report also affirms support of the sorority and fraternity system at Cornell, saying they "foster the mentoring and student-initiated community building that the committee finds so vital to the undergraduate experience."

The administration will carefully analyze the report and then deliver its own policy recommendations to the Board of Trustees later in the spring.

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