Cornell has been characterized as the first American University, because of the vision of its founding fathers in the last century with respect to equality of opportunity for persons of both sexes from all economic classes and ethnicities; and because it placed all knowledge, humanistic as well as practical technologies, on an equal, respectable academic footing free from any particular religious or philosophical framework. Dale Corson as well epitomizes these same values of fairness, egalitarianism, and respect for practical truths. So too in the latter part of the 20th century Cornell became the prototype for much of the research framework of the current American University. This framework draws upon the same fundamental egalitarian principles used by Ezra Cornell and Andrew D. White in founding the institution. I speak of the organizational framework which characterizes our large and most successful research centers, which has become the model used by many government agencies for distributing large fractions of their research funding to universities.

The story, as I understand it, begins in the late 50’s with a group of Cornellians including Dale Corson, Robert Sproull, Jim Krumhansl and especially Henri Sack (who pulled the proposal together in 10 days) who established here one of the first three DARPA-funded Interdisciplinary Labs (IDL) in the country. This lab, now known as the Cornell Center for Materials Research, has survived with continuous Federal funding for 38 years and has become, in my view, the university and national model for research centers. The unique features of the CMRR are embodied in its charter, approved by the University Faculty and the Board of Trustees. They include: The concept of a “member”. The concept of an executive committee elected by the members, and the concept of a director appointed by the Vice President for Research. The central principle of egalitarianism is expressed in the member and elected executive committee concepts: Any member of the Cornell faculty who demonstrates by his/her record research interests that lie within the defined disciplinary scope of the center may become a member when his/her application is approved by the executive committee. The new member thereafter can vote in election of members of the executive committee. The executive committee, representing as it does the interests of the members, allocates the available funding in the center among its members based on the merits of proposals submitted by them. At any given time, many members receive no funding from the center, but the mix of those who are funded changes over time as new ideas emerge, the materials field changes direction, and as the fields of faculty interest change with time and with the addition of new faculty people. The director, in the role of CEO, holds everything together and negotiates individually with members as funding allocations change. He maintains a collegial and respectful atmosphere in the center. He is appointed for a limited term (usually 3 – 5
years), and his appointment can be renewed – a process which involves a survey of member opinions.

From this organizational structure and philosophy we understand why such centers operate so harmoniously – no qualified person is excluded, no privileged class is created, all members have an equal voice, all can access and benefit from the shared, central experimental facilities which are operated by the center, and as a body they are a powerful force for attracting continued research funding to the University. CMRR funding has for some years been distributed primarily to groups of faculty. The Research Groups of 5 – 10 people are themselves interdisciplinary, and their membership and existence is fluid on the time scale of a funding cycle (3 – 5 years). This ensures that all center members have a pretty good idea of what their colleagues are doing, and can easily collaborate with them. The funding cycles themselves, which involve a national recompetition, ensure that research programs evolve dynamically and remain competitive on the national and international fronts.

The CCMR (formerly MSC) organizational format and philosophy has been the Cornell model over the years as new centers were created: Nanofabrication Facility, Theory Center, Biotechnology Center, Mathematical Sciences Institute, SRC Microscience and Technology, and important elements are shared with centers like NAIC in Arecibo and CESR in the Wilson Lab., both of which predate CCMR and have become more interdisciplinary over the years than they were at inception. Several of our centers also share an additional organizational feature: a blue-ribbon external advisory body called by various names, such as Policy Board, which in some cases may even have executive authority similar to a Board of Directors.

During the mid to late 80’s Cornell enjoyed remarkable success in establishing interdisciplinary research centers. Towards the end of that decade Cornell was the number one recipient of NSF dollars and the number two US Research University as measured by research expenditures. Perhaps for this reason the National Science board used the Cornell approach to centers as its model for a greatly expanded University Research Centers program. The Science Board held two meetings at Cornell, and took testimony from Cornell in at least two of its meetings in Washington. Subsequently, DARPA used the model in several of its University Center programs. Thus it was that the old MSC center philosophy came to pervade Cornell and the nation.

A common feature in the establishment of centers at Cornell is that they almost universally originate as bottom-up efforts. The process goes something like this: A group of faculty sees an opportunity, or a need, and begins talking about an organization to facilitate their interaction and attract group support. Before the proposal stage these discussions expand to include colleagues from other departments to achieve the large critical mass and define the common goals and good that the enterprise will serve. Frequently nowadays, the discussions expand to include colleagues from other universities, government labs, and companies, especially if the group intends to respond to Federal funding initiatives for centers with a national scope. As John Silcox pointed out to me at lunch yesterday, interdisciplinary centers are very effective in finding new
knowledge, but they also carry an overhead in faculty time and effort that makes such interdisciplinary progress more costly than work done in a single discipline – a fact not often recognized by funding agencies in their expectations of such centers.

To summarize the characteristics of Cornell centers, we can state that: 1) Many are supported by large block grants and use relatively small amounts of university funds, 2) Most are interdisciplinary and involve faculty members from several departments and more than one college, 3) Many provide shared research facilities which allow many people access to equipment they could not procure if working alone, 4) They foster collaborative research projects involving several investigators; 5) They act as magnets to attract additional resources beyond the block grant; 6) They provide frequent external review and calibration; 7) Their continuity requires constant program evolution and change; 8) They welcome new members with common interests; 9) They play important roles in graduate education; 10) They are effective in all areas of scholarship: humanities, social sciences, and physical sciences.

Some benefits of the center mode of doing research include: 1) Cost effective provision of expensive equipment or facilities, since investments benefit many people. 2) Cost effective organizational structures, since usually the number of full-time employees is very small, and these can be terminated if the block funds are not renewed. Faculty members are not tenured into centers at Cornell. Center offices usually consist of a few rooms that can easily be adapted to other purposes. Even the central laboratory spaces can usually be used by other activities. Thus centers can be terminated gracefully if required, without loss of substantial investment, or they can be reincarnated in somewhat different forms. However, if managed with vision and supported by adaptive faculty members they provide outstanding continuity in the midst of change, as witnessed by the 40 – 50 year lifetimes of some of our large centers. 3) If work is not of stellar quality, an automatic sunset is provided by loss of the block grant. 4) Centers foster mutual respect, a democratic atmosphere and communication among their members; in short collegiality. 5) They are probably the best way to do interdisciplinary research. 6) Because of Federal mandates, many of our centers now do an outstanding job of providing educational opportunities for undergraduates and some are having very effective impact on K-12 education. 7) Centers are also cost effective in other ways. Some provide capital facilities at no, or greatly reduced cost. For example, all construction costs of the facilities in Arecibo, Puerto Rico, and in Jicamarca, Peru are funded by NSF. About half the cost of Clark Hall was paid by the sponsor as was nearly all of the cost of the Wilson Lab.

The University has done a creditable job of balancing priorities in allocating its funds for physical plant among the physical sciences and other disciplines. Several buildings have been built in part because of the needs of center research. They include, for example, Rhodes Hall, Wilson Lab, Knight Lab, and the Biotechnology building. A number of academic departments are also housed in these buildings, but discounting that fact, the Cornell construction costs of these buildings total about $75 million. Their annual maintenance and utilities (excluding Wilson Lab where the utilities are paid by the sponsor) total about $2.7 million, some fraction of which is recovered by the university
through the research overhead. In a comparable period, several buildings that might be likened to central facilities, have been built for disciplines such as humanities, the arts and social sciences. These include the Johnson Museum, the Performing Arts Center, Kroch library addition, Catherwood Library, and so forth. The Cornell construction costs of these buildings total about $71 million, and their annual operating costs also total $2.7 million, none of which is recovered by overhead. These expenditures may also be compared with the $160 million construction and renovation costs projected for North and West campus student housing. It is plain to see that in allocating funds for physical plant renewal the needs of both scholarship and the undergraduate environment are considered.

These are some of my views on Centers and their impact on collaboration, coordination, competition, collegiality, costs and continuity at Cornell. I would like to congratulate Dale Corson and his colleagues of the 50’s who with such vision established principles for the successful and collegial conduct of interdisciplinary university research. I firmly believe that, if followed, the principles exemplified in the life of Dale Corson, and embodied in the CCMR charter can insure the success of current initiatives and those of the next millennium. Being a religious man, I also express my feeling that these same principles of fairness, respect, egalitarianism, inclusion, cooperation, open communication and consideration of the common voice, have led to success through past millennia of human endeavor. And to return to the opening remarks of President Rawlings and his challenge relating to enduring principles of moral knowledge, I wonder if perhaps some humanists might endeavor to determine if there are any reasonable grounds for the statement I just made. Thank you.