Forging a Research Mission for the University of Kansas

Joshua L. Rosenbloom

University of Kansas and

National Bureau of Economic Research

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> [T]he university exists to accommodate and implement the whole human learning process, and this must include creative scholarship and research. Thus research is not an optional activity of the university, not merely a legitimate pursuit for those who may be interested and willing to dedicate their spare time, nor an assignment justified to either the university or the professor by the resultant income in dollars and publicity. Rather, research is an inescapable responsibility of the university and an inseparable part of its total educational function.[1]

By far the most visible features of the University of Kansas revolve around its undergraduate education mission. Equally important to KU's identity, however, is its commitment to research and creative scholarship. Today faculty at KU are expected to devote forty percent of their working time, as much as they devote to their educational responsibilities, to these activities, and research has always been central to the university's identity. In 1890, for example, at his inauguration Chancellor Francis H. Snow observed that it was incumbent on the faculty "not only to teach the old truth, but also to discover new truth." As Clifford Griffin's history of KU's first 100 years documents this conviction that the University's role extended beyond communicating existing knowledge to the production of new knowledge was reaffirmed consistently by every subsequent Chancellor.[2]

Nationally and internationally, it is KU's role as a research university, where faculty extend the frontiers of knowledge and the next generation of scholars is trained, that is its truly distinctive feature. According to statistics collected by the

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[1] "The Place of Research in the University," June 1962, p. 3. University Governance, University of Kansas Archives, RG 3/0 Box 2, Artificial Records – 1952/53-1965/66, p. 3.

[2] Clifford S. Griffin, *The University of Kansas: A History* (Lawrence, KS 1974), pp. 3, 72, 80, 398, 481-82.

U.S. Department of Education there are over 4,600 institutions of higher education in the United States today. At most of these institutions, however, the primary focus is on teaching. Only about 300 institutions are classified as research universities and just 108 of these—including the elite private universities and most major state flagship universities—are classified by the Carnegie Foundation as: "very high research activity." KU is one of these 108 research-intensive universities.

Although KU's identity as a research university has very deep roots, the meaning of this commitment has changed dramatically in the last fifty years. The transformations that KU experienced over this half century were not unique. Since the late 1950s larger societal forces have contributed to a growing emphasis on science and engineering and the expansion of higher education, resulting in a substantial broadening of the nation's research capability beyond the small group of elite private universities and select public campuses that had dominated research and graduate training in the pre-World War II era.[3] The changes that took place at the University of Kansas were thus the local manifestations of a broader transformation of the country's university system.

Among the broader forces that impinged on KU since the early 1960s the most important were a rapid expansion in federal funding for scientific and engineering research and rapid expansion of undergraduate enrollments caused by the post-war baby boom. Between 1957 and 1967, inflation adjusted federal research and development funding for universities more than quadrupled (see

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[3] Hugh Davis Graham and Nancy Diamond, *The Rise of American Research Universities: Elites and Challengers in the Postwar Era* (Baltimore: Johns Hopkins University Press, 1997), ch. 2.

Figure 1). Meanwhile funding agencies focused on distributing these funds beyond the select group of universities that had dominated federal research support during and immediately after the Second World War. As federal funding expanded, support also expanded beyond the physical sciences and engineering. In 1965 the formation of the National Endowment for the Arts and Humanities created new opportunities for scholars in the creative arts and humanistic fields of study, and in 1968 the mandate of the National Science Foundation was expanded to incorporate funding for the social sciences.

Rising federal investments in science, engineering and other fields of scholarship coincided with rapidly rising undergraduate enrollments as the first wave of the baby boom generation reached college age. Rising rates of college attendance, and increased federal financial aid contributed to a massive increase in the number of undergraduates arriving on campus in the 1960s. At KU, although rising enrollment placed substantial strains on the university, the new students also provided an important infusion of resources that helped support increases in faculty numbers, new campus construction, the growth of graduate programs and growing research capabilities.

The heady growth that had characterized higher education in the decade after 1957 came to an end in the late 1960s. After 1968, the growth of federal funding for research and development slowed and became more unpredictable. Nonetheless, as the basis of American economic leadership shifted from industrial production to innovation, science and engineering advances assumed a greater importance for government and industry alike. The growing national focus on the

sciences stimulated continued growth in both the demand for science and engineering research at the nation's universities and the resources to support the expansion of university research capabilities across the late-twentieth and early-twenty first centuries.

The focus of this chapter is on the how KU's responses to the changing research environment over the past fifty years have altered the University's research mission. Viewed in aggregate the research activities of the university are both vast and highly varied, reflecting the great diversity of expertise and interests of its faculty. It is obviously not possible to provide a coherent account of all the different strands of scholarship to which KU faculty and students have contributed over the past half-century. In particular, it will not be possible to provide anything like an adequate portrait of the activities of scholarship in the arts and humanities. Rather, the focus will be on those areas of scholarly activity that are distinctive at KU, and on the organizational and institutional structures that have been created to support the university's research mission.

The Place of Research at KU in the early 1960s

By virtue of its history and aspirations in its first hundred years, the University of Kansas was positioned to respond to the opportunities that the infusion of new resources for university research have created since the late 1950s. In the early 1960s, KU could point to well-established and recognized areas of

research strength in zoology, entomology, bacteriology, geology and chemistry, as well as important applied research and service activities of the Kansas Geological Survey and Kansas Biological Survey.[4] Moreover, in 1951, the legislature had, after repeated urging from Chancellor Malott, authorized $300,000 annually to establish a General Research Fund.[5]

Nevertheless, as the university approached its centennial its commitment and that of the state to the investments necessary to become a full-fledged research university remained somewhat tenuous. The amount authorized by the legislature for the General Research Fund had increased only to $304,000 by 1959. Moreover, a 1957 comprehensive survey of higher education in the state found that KU faculty reported spending 66 percent of their time on teaching and only 16 percent on research. In 1961, when Alvin Eurich of the Ford Foundation conducted another assessment at the invitation of the Board of Regents he reported as well that "research effort is too low."[6]

In the Fall of 1960, shortly after his appointment as Chancellor, W. Clarke Wescoe appointed a committee to examine the place of research in the University. Chaired by William J. Argersinger, Professor of Chemistry and Associate Dean of the Graduate School, the committee proceeded deliberately, delivering a lengthy report in June 1962. After reiterating the central place that research must play in the university, the report turned to the major determinants of the university's research

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[4] William J. Argersinger, Jr. to W. Clarke Wescoe, 9 September 1960, file 31, box 3, University of Kansas Chancellor's Office Records, Chancellor W. Clarke Wescoe , RG 2/12/5, Correspondence – Departmental, 1960/1961, Kenneth Spencer Research Library, University of Kansas Libraries.
[5] Griffin, *University of Kansas*, pp. 511, 521, 539.
[6] Griffin, *University of Kansas*, pp. 678-79; 680-82.

activity, describing in turn the role of the faculty, libraries, museums and reservations, the physical plant and the administrative structures that supported research activities before offering its recommendations.

The faculty are, the committee observed, the key ingredient determining the quality and level of research activity at the university, but confronted by a lack of "knowledge and understanding of why some university faculty members are dedicated to research and others are indifferent or even contemptuous toward it…" the committee urged that the focus be on selecting new faculty members inclined toward research, creating an atmosphere conducive to conducting research by limiting demands on faculty for service and administrative tasks, and placing a greater emphasis on research in promotion decisions.

If the committee's recommendations about promoting research activity among the faculty maintained a level of generality, its review of the university's support of the libraries and research collections was more pointed. While noting the relatively generous support that the libraries had received in the previous decade, the committee clearly articulated the growing demands placed on library staff and budgets by the profusion of new publications, the addition of new programs and research areas, and the anticipated growth in enrollment in the coming decade, all of which would require further commitments of resources.

Similarly, the committee pointed out the inadequate support that was provided to preserve, provide access to and expand the university's research collections. "Staff in our museums is in several cases almost tragically short," the committee concluded. "From the standpoint of number of specimens and potential

research importance, two of our most important research collections are the Museum of Invertebrate Paleontology and the Snow Entomological Museum…Each is well known throughout the country not only for its importance…but for its inadequate staff.[7] Materials in these collections must not, the committee concluded be allowed to deteriorate due to neglect. Meeting the staffing needs of these collections, the committee urged, needed to be separated from the university's teaching mission to insure continuity, while additional space for research and storage needed to be built.

Space needs for research varied widely across disciplines the committee noted, but they wrote that "every faculty member and graduate student should have space, adequate in size and free from distraction, in which he can carry on research appropriate to his responsibilities." That the committee had to further recommend that "at a minimum private offices should be provided for all full-time faculty members" provides a hint of just how limited space must have been at the time.[8]

In it's concluding section the committee turned to the administrative organization of the university's research activities. Reflecting the growing importance of research it recommended the establishment of a standing committee on research to manage allocation of the General Research Fund to support faculty research projects, as well as to provide advice and recommendations to the administration on research related matters. The committee also noted the decentralized and potentially confusing arrangements that governed the receipt and disbursement of external research funding, and proposed the establishment of a

[7] "The Place of Research in the University," p. 37.
[8] "The Place of Research in the University," pp. 42, 45.

legally distinct Research Foundation to consolidate management of sponsored research funds.[9]

Given the general nature of many of the committee's recommendations concerning faculty appointments, support for libraries, research collections, and research space and equipment it is difficult to identify whether they had much immediate impact. On the other hand, a standing committee on research was created and continues today as a body of the Faculty Senate. Although it took considerably longer, the committee's suggestion to consolidate research support in a separate research foundation was also eventually implemented, but the path to achieving this goal was neither short nor direct.

Laying the Foundations for a Modern Research University: the 1960s

Around the time that the committee was laboring over its report on the place of research in the university, KU's leadership was laying the foundations that would largely define the areas of the University's research excellence for the next half century. Consistent with the central role the committee placed on hiring and cultivating faculty for their engagement with research, each of these actions centered on the recruitment or retention of a few key individuals.

Building a program in Child Research

[9] "The Place of Research in the University," 52-62.

In the late 1950s a small group of KU researchers led by Richard Schiefelbusch was embarking on a trajectory of research that would make KU a leader in the emerging field of applied behavioral science. Their success reflects the confluence of novel ideas with the availability of resources created by an expanding stream of federal funding. That this took place at KU was the result of the efforts in 1954 of Chancellor Franklin Murphy and George Waggoner, Dean of the College of Liberal Arts and Sciences to dissuade Schiefelbusch from leaving KU to accept a tenured appointment at the University of Illinois.[10]

Seeking to find out what it would take to keep Schieflbusch in Kansas, Murphy invited him to offer suggestions about what actions the university would need to take to be active in child research. Thinking that he was leaving the University, Schiefelbusch offered a candid picture of the changes he believed necessary. Most importantly, he suggested, the university would need to create a natural environment for child research, such as a child care center that would allow researchers to collaborate in their studies and train their students. Shortly after this meeting Murphy offered to implement the changes that Schiefelbusch had proposed if he would stay at KU and assume leadership of the Bureau of Child Research, a largely inactive organization that had been founded by Florence Sherbon in 1921. Murphy also offered $30,000 in funding, an amount that covered the salary of the

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[10] This and the following paragraphs draw heavily on Karen Salisbury Henry, "Just What We Needed", KUHistory.com http://kuhistory.com/articles/just-what-we-need/ , accessed 5 March 2013 and Richard L. Schiefelbusch and Stephen R. Schroeder, eds., *Doing Science and Doing Good: A History of the Bureau of Child Research and the Schiefelbusch Institute for Life Span Studies at the University of Kansas* (Baltimore: Paul H. Brookes, 2006), chs. 2, 5 and 9.

Bureau's director and its administrative staff, but left little to support any actual research.

Murphy had envisioned the Bureau of Child Research primarily as a coordinating body that would bring together disparate units across the Medical School and Lawrence campuses engaged in different aspects of child research. Schiefelbusch soon found, however, that there was in fact little common interest across these units, and thus he embarked on a different path, turning the Bureau into a research unit in its own right. To do this he took an unorthodox path, forging a partnership with Howard Bair, the leader of the Parsons State Hospital and training Center. Bair was seeking a way to address the needs of the most profoundly retarded children in his care, and Schiefelbusch and the small team of psychologists he recruited saw in the behavioral theories of B. F. Skinner a potential tool to transform modes of treatment.

By 1958 the team had received its first grant, for $56,000, from the National Institute of Mental Health. Probing "the silence of profound mental retardation … [the team] found a possible passage to communication when they proved that these children could learn." [11] When the results of their initial exploration were presented in 1959 the news spread quickly and a growing stream of visitors found their way to the Parsons facility to learn more about what they had accomplished. This initial success lead to a renewal of their original grant and a 50 percent increase in funding in 1961 and the addition in 1962 of a pre-doctoral training grant.

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[11] Karen Salisbury Henry, "Just What We Needed."

In 1963 Schiefelbusch took the project to a new level, applying for and winning a $2 million grant from the newly established National Institute of Child Health and Human Development. These funds supported the establishment of a coordinated research program that now engaged scholars on the KU Medical Center and Lawrence campuses as well as at the Parsons Center. Increased funding and increased visibility were accompanied by the recruitment of other researchers.

Despite the success at Parsons, Schiefelbusch recognized that he needed to cultivate a partnership with an academic department if the research program he had launched was to be sustained. The department he selected was Home Economics, which with his encouragement would soon be transformed into the Department of Human Development and Family Life.

In 1961, Schiefelbusch had recruited Frances Horowitz to join the staff of the Bureau of Child Research. Horowitz had worked at the Bureau of Child Research briefly in 1960 after completing her graduate studies, and Schieflbusch wanted to bring her back. To do so he convinced the Dean of the College of Liberal Arts and Sciences, George Waggoner, to offer her husband, Floyd, a position in the English Department. At the time, KU had a nepotism rule that prevented Frances from being offered a faculty position, but Schiefelbusch was able to offer her an appointment at the Bureau of Child Research, and the couple accepted these positions.

By 1963 the nepotism rule had been changed and Horowitz was offered a position in the Home Economics Department. Within a few years she had risen to become the chair of the newly reorganized Department of Human Development and Family Life. In 1965 Horowitz and Schiefelbusch successfully recruited a group of

four of the leading researchers in behavioral psychology—R. Vance Hall, Donald Baer, Todd Risley and Montrose Wolf—all at the University of Washington to KU, solidifying KU's position as the leader in the new field of applied behavioral science. This leadership in turn helped KU to compete successfully in 1967 to become one of the first of a national network of mental retardation research centers funded under legislation that had been signed on October 31, 1963 by President John F. Kennedy. By the early 1970s KU researchers had added a fourth location, the Juniper Gardens Children's Project, located initially in the basement of a liquor store in one of the roughest neighborhoods in Kansas City, Kansas.

The mental retardation research center funding has been renewed repeatedly since 1967 and continues to the present. During the 1970s and 1980s, the Bureau of Child Research spun off an increasingly diverse array of research groups dealing not just with child research, but with all aspects of the life span. These included the Gerontology Center, the Beach Center on Disability, the Work Group on Health Promotion and Community Development, the Center for Research on Learning and the Merrill Advanced Studies Center, among others. In the 1980s the Bureau negotiated several difficult transitions, including declining federal funding and the retirement of Richard Schiefelbusch from his position as director. Nonetheless, research activity continued to grow, and with the support of U.S. Senator Robert Dole, funding was secured for construction of a new building, the Dole Human Development Center.

In 1990, the Schiefelbusch Institute for Life Span Studies (commonly called the Life Span Institute or LSI) was established as an umbrella organization

comprising the Bureau of Child Research and many of the offshoots to which it had given rise over the years. At the time this conglomeration of researchers accounted for approximately one-quarter of the federal research dollars that the University of Kansas received. Since the 1990s renewed growth in federal funding and astute leadership have helped LSI to continue to grow and adapt to the rapid technological and scientific changes that have reshaped behavioral science research.

Putting the School of Pharmacy on the Map

At roughly the same time that Schiefelbusch's research efforts were starting to take off, the university also launched a concerted effort to expand and strengthen the School of Pharmacy. In the early 1960s the school had just six faculty members and a budget of only a few hundred thousand dollars. In 1966 Chancellor Wescoe hired Howard Mossberg, then a young faculty member at Southwest State University in Oklahoma to fill the position of Dean that had been left vacant after Duane Wenzel returned to teaching and research. Wescoe, Mossberg and Ed Smissman, the chair of the Medicinal Chemistry Department, who had been recruited from the University of Wisconsin 1960 then undertook an ambitious effort to bring Takeru "Tak" Higuchi to Kansas.

Higuchi, the Edward Kremers Professor of Pharmaceutical Chemistry, at the University of Wisconsin, where he had taught since 1947 was prolific scholar who was widely regard as the "father of physical pharmacy" because of his emphasis on the importance of understanding the basic chemical and physical processes

underlying pharmaceutical chemistry. Convincing an established scholar of Higuchi's caliber to leave Wisconsin for Kansas took a major effort. To get Higuchi, the university offered him what was at the time one of only two Regents Professorship at the university.[12] In addition, the University offered Higuchi the resources to develop a nationally recognized program in pharmaceutical chemistry, and promised to house him and his students in a new Pharmaceutical Chemistry building that was already under construction, in what would become the West Campus.

Perhaps the strongest inducement that KU offered, however, was its willingness to support Higuchi's interest in converting scientific discoveries to commercial applications. At Wisconsin Higuchi was chafing under the restrictions that the Wisconsin Alumni Research Foundation (WARF) imposed on his interactions with the pharmaceutical industry. In contrast, the KU Endowment Association (KUEA) was keen to support these efforts, which it was hoped would help to promote economic growth in the state.

While Higuchi was only one of several hires made in these years, he was the focal point around with the School of Pharmacy grew. Higuchi was a prolific scholar who published more than 200 articles and acquired more than 50 patents during his career, as well as an influential teacher who supervised close to 200 graduate students. One colleague estimated that he had "trained more people in upper and middle management in the US pharmaceutical industry than anyone else, and that

[12] Funded by the Kansas Board of Regents, these positions are reserved for distinguished scholars who can contribute to the state's economic development as well as the university's academic distinction. The other Regents Professor at this time was Charles Michener, an entomologist specializing in bees.

one-third of the nation's pharmacy school deans and department chairmen [were] former Higuchi students."[13] Beyond these tangible effects, however, Higuchi was instrumental in creating, in the words of one former student and colleague, a "culture of cooperation and good citizenship" that helped to nurture new researchers.

Higuchi's example also served to encourage at the school a spirit of entrepreneurship, engagement in economic development and a desire to be involved in moving discoveries from the laboratory to the marketplace. In 1968, shortly after Higuchi's arrival at KU, Alejandro Zaffaroni sought Higuchi's participation in a California-based drug research firm. When Higuchi declined to relocate, Zaffaroni, with the Endowment Association's assistance decided to construct a building on KU's West Campus where Higuchi could carry out his work for the company. In addition to the building, Higuchi extracted 10,000 shares of stock in Zaffaroni's Alza Corporation for the Endowment Association. The value of these shares appreciated significantly in the next few years and the KUEA profited handsomely.

In 1972, Alza chose to relocate its research to California and its building reverted to the University. Using proceeds from the sale of their shares in Alza, Higuchi and the KUEA established a new corporation INTERx, capitalized at $5 million, which would occupy the building original built for Alza. Eight years later, in 1980, the pharmaceutical giant Merck purchased INTERx for $9 million, producing

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[13] Mark Hersey, "It's all in the Delivery," KUHistory.com http://kuhistory.com/articles/its-all-in-the-delivery/ accessed 14 July 2013.

another large return for Higuchi and the KUEA. Higuchi remained in the role of president of INTERx as well as vice President for Merk's Research Laboratories.

In 1983, Higuchi and the KUEA spun out another private enterprise, Oread Labs to take advantage of opportunities created by a newly adopted state economic development plan Drawn up by two KU School of Business professors, Tony Redwood and Chuck Krider, the plan called for funds from the recently established state lottery to be distributed by a newly created entity, the Kansas Technology Enterprise Corporation (KTEC), to fund Centers of Excellence at the Regents Institutions. Each center required a corporate partner willing to match state investments dollar for dollar.

Higuchi and the KUEA established Oread Laboratories as a for profit company to provide the matching funds to establish the KTEC supported Center for Bioanalytical Research. KUEA invested an initial $750,000 in the venture and Higuchi rounded up other investors, including the City of Lawrence, which issued industrial revenue bonds to finance its investment, and the start-up company ultimately raised $7 million. Thus, Higuchi and the KUEA were pioneers in developing many of the ingredients that would in the next few decades come to characterize university-industry relationships, such as university "incubators" and patent licensing agreements.

Ultimately the ability to sustain productive relationships with industry depended upon creating and sustaining a first rate school of pharmacy. In these years Higuchi, Smissman, and the colleagues were successful in making the KU School of Pharmacy one of the field's leading centers of academic training and

research. While recruiting Higuchi was central to the rising prominence of the School of Pharmacy, the school's success reflected a collective effort and was ultimately the result of the recruitment of many other talented scholars, and the culture of collaboration between the school's departments of Pharmaceutical Chemistry and Medicinal Chemistry on the one hand and faculty in the department of Chemistry in the College of Liberal Arts and Sciences. Important in tying these departments together was an emphasis on shared responsibility in the management of expensive research facilities such as Mass Spectrometry, Nuclear Magnetic Resonance imaging, and X-ray crystallography. Building on these foundations, faculty in the school of Pharmacy have continued the traditions of cutting edge research and engagement with technology transfer and commercialization established by Higuchi.

Developing the Field of Remote Sensing

Another influential addition to the KU faculty in the early 1960s was Richard K. Moore. In 1962 the School of Engineering recruited Moore from the University of New Mexico where he was the chair of the electrical engineering department. Beginning in the mid-1950s at New Mexico Moore had overseen a substantial expansion of the department and led its establishment of a Ph.D. program. Having built the program, however, Moore was ready to move on, rather than shifting to the

role of overseeing the department as it reached maturity. Thus he was receptive when KU offered him a Distinguished Professorship.[14]

Moore's work in radar was sufficiently well known that in 1963 he was approached by representatives of NASA who were interested in developing tools for planetary observation to be incorporated in the Apollo program.[15] By 1964 Moore had become a member of the NASA Radar Remote Sensing advisory group. This was the beginning of a long-running relationship in which Moore played an important part in developing techniques of microwave remote sensing in conjunction with NASA, the U.S. Army and the Office of Naval Research.

At Kansas, Moore was instrumental in the founding of the KU Remote Sensing Lab, which was established in 1964. Recognizing that the value of the data generated by remote sensing would be greatest for scholars in disciplines outside engineering, Moore was quick to seek partners in these other fields, including oceanography and geography. Among the important discoveries that Moore and his partners in the Remote Sensing Lab produced was the demonstration based on experiments conducted on Skylab that it is possible to measure from space both the direction and speed of winds at the surface of the ocean.

Moore was also involved in work supported by the Office of Naval Research to map arctic sea ice. It was this line of research that brought Prasad Gogineni from India to KU as a graduate student in 1979. After completing his dissertation, Gogineni was obliged to leave the country because of visa issues, but Moore was

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[14] University of Kansas, Spencer Research Library, University Archives, Endacott Society Oral History, Richard K. Moore, p. 15.
[15] University of Kansas, Spencer Research Library, University Archives, Endacott Society Oral History, Richard K. Moore, p. 20.

instrumental in connecting him with European researchers working on related topics. A few years later, Gogineni was able to return to a faculty appointment at KU. After returning to KU, Gogineni continued to pursue novel work in remote sensing. He also spent time at NASA as program officer, an experience that allowed him to see how complex, multi-institution research projects were put together and managed. In 2005, drawing on both his scientific expertise and his experience with large-scale funding, Gogineni secured a grant from the National Science Foundation for an Engineering Science and Technology Center that established the Center for Remote Sensing of Ice Sheets (CReSIS).

Working in conjunction with colleagues in aeronautical engineering to put sophisticated radar devices on unmanned aerial vehicles, CReSIS has become a major contributor to research documenting the effects of climate change on the polar ice caps. At the same time CReSIS has stimulated other collaborations within the university, including a multimillion dollar award from the National Science Foundation to support an interdisciplinary graduate education and research program focusing on the human causes and consequences of global climate change led by Sociology Professor Joane Nagel.

Consolidation and Adaptation: the 1970s and 1980s

In the late 1960s the conditions that had fostered the growth of significant new research programs at KU came rather abruptly to an end. On the one hand, the external funding environment became considerably less conducive to growth.

Federal funding for university research, which had grown much faster than the overall economy after 1957, slowed sharply after 1968. It did not begin to pick up again, until the early 1980s (see Figure 1).

On the other hand, circumstances internal to the university shifted the focus of leadership from academic to other issues. Growing student unrest about U.S. involvement in the Vietnam War coincided with and to some extent contributed to turnover in the University's leadership. In 1969, W. Clarke Wescoe resigned his post as Chancellor and was replaced by Laurence Chalmers. Chalmers' brief tenure in the Chancellorship, 1969-1972, was largely taken up with responding to student demands and protests, leaving little opportunity to set direction for the research enterprise.

Although Chalmer's departure was the most dramatic, it was not the only leadership change at the time. During Chalmers' tenure his relationship with Francis Heller, who had served as Dean of Faculties, the chief academic officer for the Lawrence Campus, had grown increasingly strained. Shortly before his own resignation, Chalmers asked for Heller's resignation and embarked on a more sweeping administrative reorganization. Then, in 1974, George Waggoner, who had served as Dean of the College of Liberal Arts and Sciences since the mid-1950s suffered a stroke and was obliged to resign.

Chalmers departure ushered in a period of instability at the top for KU. In August 1972, Raymond Nichols, who had served as Vice Chancellor for administration was appointed acting chancellor. Nichols background was largely on the financial and administrative side of the university and in any event he was

primarily acting as a caretaker while a search was conducted for a permanent replacement. Although Archie Dykes, who succeeded Nichols in 1973, served as Chancellor until 1980, by all accounts his focus during much of this time was on repairing relations with the legislature and the citizens of the state, which had been severely strained during the student activism of the late 1960s and early 1970s.

Turnover at the top coincided with economic difficulties in the state, resulting in tighter budgets for KU. Robert Cobb, who succeeded George Waggoner as Dean of the College of Liberal Arts and Sciences described the period from 1975 to 1985 as one of periodic recisions. "We tried," he recalled, "to recruit the best faculty we could, tried to build the library and maintain infrastructure….[but it] was more a matter of protecting and enhancing the programs we had in place."[16]

Not until the appointment of Gene Budig to the Chancellorship in 1981, was there an opportunity to focus on the University's research mission. And, while Budig was generally supportive of research, building a research program was not central to his concerns.

Research is, of course, largely a grass-roots activity, carried out by the faculty. As such, the work of discovery and dissemination of knowledge continued largely unaffected by the turbulence and turnover in KU's leadership. As we have already seen, the successful research programs that were initiated in the 1950s and 1960s continued to grow and diversify. Even with the slowdown in federal funding these successful programs of research were able to compete for the support they needed. In addition, new faculty initiatives, especially in the humanities, helped to

[16] University of Kansas, Spencer Research Library, University Archives, Endacott Society Oral History, Robert Cobb, p. 34

broaden research activity. Meanwhile, the university was developing the administrative apparatus necessary to effectively manage the increased volume of federal research funding.

Formalizing Research Administration

By the early 1970s the University was receiving something on the order of $10-$14 million annually in federal research support. This was perhaps a 6 – or 7-fold increase since the early 1960s. As the volume of support increased the administrative challenges of managing these funds grew as well. More attention had to be given to accounting for the use of these funds and insuring compliance with federal accounting standards. At the same time, as the overall funding environment became more competitive, understanding the priorities and objectives of funding agencies took on a heightened importance.

Compliance with federal regulations regarding the conduct of research required increased attention as well. By the early 1970s several well-publicized revelations about abuses of human subjects in government funded medical studies had led to a significant tightening of regulations that required the university to develop new administrative oversight capabilities and ensure that scholars were complying with the rules.

In the late 1950s, the University had assigned responsibility for research administration to the graduate school, where it was handled by William Argersinger, who occupied the position of Associate Dean. In 1962, following completion of the

committee report on the place of research in the university, and reflecting the growing importance of research administration, Argersinger was appointed to a newly created position as Associate Dean of Faculties for Research. In 1972, as part of the administrative reorganization undertaken by Chancellor Chalmers research administration and graduate studies were once again placed within the same organization. In this reorganization Chalmers named Argersinger Vice Chancellor for Research and Graduate Studies and Dean of the Graduate School. Argersinger in turn appointed Henry Snyder as Dean of Research within this newly established office.[17]

Despite these changes in the location of responsibility for research administration, staff support remained quite limited. Throughout the 1960s and 1970s Argersinger personally retained responsibility for managing a great many of the necessary tasks. "From about 1968 on," he recalled, "my teaching in the Department was perforce minimal….I was on continuous call by the Chancellor…Most of the active faculty I knew by name, face and interest, including many at KUMC. It was necessary for me to travel frequently to Washington to visit Federal agencies…"[18]

The demands of the position and the growing formalization of university administration that followed from the increased scale and complexity of the university in the early 1970s led Argersinger to tender his resignation in the Fall of 1977. Following Argersinger's resignation, Chancellor Dykes appointed a

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[17] William J. Argersinger, Jr., "Reminescences [sic] of William J. Argersinger, Jr. University of Kansas Archives June 16, 1989, pp. 22-23.
[18] Argersinger, "Reminescences", p. 25

committee to consider the future organization of research and graduate studies at KU. After a lengthy review the committee concluded that these two areas should continue to be part of a combined office and that "Public Service" should be added to its portfolio to better promote the University's links with state legislature, the business community and the Kansas congressional delegation. In 1978, the university conducted a national search to fill the newly created position of Vice Chancellor for Research, Graduate Studies & Public Service and Dean of the Graduate School.

The result of that search was the selection of Frances Horowitz, an active researcher who had for the past decade served as chair of the Department of Human Development and Family Life. A natural consensus builder, Horowitz deliberately staffed her office with faculty representing the range of disciplines engaged in sponsored research. She also embraced the challenges of research administration and cultivated a staff with the expertise to deal with funding agencies and effectively manage compliance with award conditions. At the same time, she established a "Red Tape" committee to identify bureaucratic processes that were annoying people and find ways to reduce these annoyances. One early change that resulted from these efforts was her decision to allow non-faculty to serve as the Principal Investigators on sponsored projects so long as they had the endorsement of a department or research unit to support the project if funded.

Horowitz also embraced the Public Service responsibilities of the new office. She cultivated a warm relationship with the Lawrence/Douglas County Chamber of Commerce and other local business interests, and participated actively in their

efforts at business recruitment. To increase KU's presence in Washington she hired a consultant there to work with the Kansas delegation to insure that KU did not miss opportunities to tap federal funds. These contacts proved important in securing federal funding for construction of the Dole Human Development center.

Establishing a Home for the Humanities

The idea of creating a center for humanistic studies at KU first surfaced in 1969 when a small group of faculty who formed the Humanistic Studies Group proposed the idea to Chancellor Chalmers. Chalmers took no action, however, and the idea languished until 1975, when Richard DeGeorge, Henry Snyder and Hal Orel raised the idea again with the Dean of the College of Liberal Arts and Sciences. Describing their motivations, DeGeorge observed that it "was a period of little faculty turnover and we faced the prospect of growing old and stale together."[19] The initial response from the College was lukewarm, however, citing a lack of funds and the likely opposition to the idea from the various departments.

Undeterred, the group drafted a proposal that was sent to the humanities faculty, and secured the endorsement of the Vice Chancellor for Research and Graduate Studies, William Argersinger. With this sponsorship, Chancellor Dykes submitted a proposal to establish a Center for Humanistic Studies to the Board of Regents. The Regents approved it in September1976, but no funds, space or administrative support was provided for the fledgling center.

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[19] Richard DeGeorge, "Center for Humanistic Studies," photocopy, University of Kansas, 2013.

"The future of the Center did not look very rosy, and the message we got," DeGeorge recalled, "was that we were on our own." He and Snyder revised their earlier proposal emphasizing faculty development and promotion of humanities on campus and began to approach foundations. In 1977, they were successful in securing a three-year grant from the Andrew W. Mellon Foundation for $315,000. A few weeks later the College Dean appointed DeGeorge, Snyder, and Andrew Debicki as co-Directors of the center.

Housed at the time in two rooms on the main floor of the Spencer Research Library, the Center hired an assistant to the Director in 1978, and ran its first faculty development seminar in the spring of 1979. The Center also became involved in managing grant funds, administering a Museum and Humanities grant secured by Marilyn Stockstad and a number of NEH funded seminars.

Around this time, the center was moved administratively from the College of Liberal Arts and Sciences to the newly created office of Research, Graduate Studies & Public Service. Seeking to broaden to scope of the center's leadership, Vice Chancellor Horowitz appointed new leadership.

In 1980 the Mellon Foundation renewed its support, providing $200,000 for another two years. In 1982, the Center and the Libraries put in a proposal for a National Endowment for the Humanities Challenge Grant, seeking the maximum amount allowed, $1.5 million. To everyone's great surprise, the proposal was successful and the NEH awarded the University $1 million, receipt of which required a three-to-one match from private funds. Matching funds were provided by the Hall

Family Foundation, establishing a sizeable endowment to support the center, which was renamed the Hall Center for the Humanities.

As the Center's activities expanded it moved into its own quarters in the former Watkins Home. In 2000 the center was successful in obtaining a second NEH Challenge grant of $500,000 and with an additional $2 million in private funds substantially expanded its programs, adding major new outreach programs within the state as well as new support for fellowships for KU faculty and for a public humanities scholar. With this expansion the Center was increasingly cramped, and in 2005 it moved into a new home in the restored KU powerhouse building.

In 2011, the center was able to obtain an unprecedented third NEH challenge grant to support the development of programs to advance collaborative and interdisciplinary research within the humanities. It has also developed partnerships with the Spencer Art Museum and the Biodiversity Research Institute to promote dialogue between the humanities and other scholarly disciplines.

A Renewed Sense of Direction: Research in the 1990s and Beyond

After stagnating for more than a decade, federal research and development funding for colleges and universities began to increase again in the early 1980s (see Figure 1). KU was, however, poorly positioned to take advantage of much of the funding that became available in the 1980s and early 1990s. Most of the growth in funding originated with the National Institutes of Health and was directed toward

biomedical research activities. Although some units on the Lawrence campus – such as the School of Pharmacy and the research centers that would become the Life Span Institute—were able to compete effectively for these funds, the KU Medical Center was dominated by its physician groups, which concentrated mainly on clinical income and devoted relatively little attention to building competitive research programs. As a result KU was not able to capitalize on rising federal funds in the way that many other universities with academic medical centers did at this time.

Only in the mid-1990s, with the appointment of Robert Hemenway as Chancellor did the University embark once again on a concerted effort to expand its engagement in externally sponsored research. Hemenway's arrival on campus in early 1996 helped to catalyze a set of strategic changes that solidified KU's identity as a research university and created the organizational apparatus to support this commitment.

Creating the KU Center for Research (KUCR)

The idea of establishing a research foundation legally distinct from the University to manage sponsored research funds has had a long history. Indeed it dates back at least to the 1962 report on the place of research in the university, which had recommended the establishment of such a foundation. Noting that a number of other public research universities had established similar foundations, the report identified a number of advantages of the foundation model. These included freedom from many of the restrictions on contracting imposed on the

University as a state agency; a greater ability to invest idle funds and to carry funding forward across fiscal years; as well as the ability to insure that research funds could not be diverted by the state to support other uses. In addition, such an entity could consolidate many of the financial and accounting functions that were dispersed across different university units, reducing the administrative costs and faculty time invested in conducting sponsored research.[20]

Such an entity, the University of Kansas Center for Research, Inc. (referred to as "CRINC"), was in fact chartered in June 1962 as a 501(c)3, non-profit corporation. For reasons that remain somewhat murky, however, CRINC assumed responsibility only for sponsored research conducted by faculty affiliated with the School of Engineering. In November 1962 all of the assets and liabilities of the Center for Research in Engineering ,which had been formed in 1958 by John S. McNown, Dean of the School of Engineering, were transferred to CRINC.

The recommendation to establish a research foundation surfaced again in the early 1980s when Vice Chancellor Frances Horowitz charged a committee to look into the organization of research administration.[21] The recommendations of the committee were, however, complicated by the existence of CRINC. The committee struggled without much success to envision how the proposed research foundation would relate to CRINC, and , once again, resistance or inertia prevented the implementation of these recommendations.

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[20] "The Place of Research in the University," pp. 60-62.
[21] "Report of the Research Foundation Committee," August, 1981, University of Kansas Archives, Governance, Research: Correspondence, Memoranda, Minutes and Artificial Records, Series No. 3/7/12, Box No.?

Not until 1996, was it possible to move forward. The impetus for success at that time was the arrival Chancellor Hemenway. Much of the work of making the transition possible was accomplished by Howard Mossberg. Having been recruited in 1966 at age 33 to serve as Dean of the School of Pharmacy, Mossberg had presided over the expansion of the school's faculty from 6 to 42 and seen the school rise to the top ranks in its field. In 1991, after 25 years as Dean, Mossberg had been asked to serve as interim Vice Chancellor for Research, Graduate Studies and Public Service after Frances Horowitz had accepted a position as president of the Graduate School and University Center of City College of New York.

Although Mossberg chose not to be a candidate for the Vice Chancellorship, his interim appointment was extended when the candidate selected for the post, Andrew Debicki, a Professor Spanish, was awarded a fellowship the following year. After Debicki returned, Mossberg remained in the Chancellor's office, where he served as special counselor to the Chancellor, and picked up responsibilities for technology transfer and commercialization that Debicki was not inclined to undertake.

Thus, when Hemenway arrived on campus in the Spring of 1996, he and Mossberg soon began a lengthy discussion of how to advance the University's research profile.[22] Mossberg was an advocate of the research foundation model and Hemenway was receptive to this idea, having come from the University of Kentucky where such a foundation managed all sponsored research. Bringing Mossberg back

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[22] Hemenway's appointment officially began on July 1, 1996, but when he accepted the KU position the University of Kentucky terminated his appointment, leaving him free to spend much of the Spring at KU planning for his transition.

as Vice Chancellor for Research in 1996-97, Hemenway charged him with the task of leading an implementation process that would transform CRINC from its role supporting Engineering research to a university-wide research foundation.

Over the course of the next year, working with a committee of faculty and administrators, Mossberg addressed the full range of practical issues involved in the transition: developing a policy for the distribution of the research overhead, purchasing Youngberg Hall from the Endowment Association, to house the expanded research foundation, and defusing many of the concerns of faculty about the impact that the change would have.

In parallel with these discussions, Hemenway also conducted a year-long study that led to a significant reorganization of university leadership. On the Lawrence Campus, the shift to a Provost model of organization in which all of the University's academic and non-academic functions reported to the Provost shifted the focus of leadership in a way that elevated the importance of the research mission and insured that university support functions were directed toward academic priorities. David Shulenburger, who had served as Vice Chancellor for Academic Affairs, and was appointed as Provost recalled that with implementation of the Provost model research performance became an increasingly important consideration both in individual promotion and tenure decisions, and in the evaluation of Deans.[23]

As part of Hemenway's reorganization, the leadership of Research and the Graduate School was divided. Andrew Debicki remained as Dean of the Graduate

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[23] Author's interview with David Shulenberger, 27 January 2013.

School and assumed responsibility also for International Programs, while a new position, Vice Chancellor for Research was established. A national search was conducted to fill this new position and Robert Barnhill, a Kansas native, who had earned a BA from KU in 1961 and gone on to earn a Ph.D. in mathematics from the University of Wisconsin was hired in 1997 to fill the position. Barnhill had spent the past 11 years at Arizona State University, first as Chair of the Computer Science Department and then Vice President for Research. During his time in the latter office Arizona State had doubled the amount of its external research funding.

Perceiving the need for a fresh start with the research foundation, one of Barnhill's first actions was to rename the research foundation, changing its identity to the KU Center for Research, or KUCR. At the same time Barnhill set about the difficult task of creating a unified research administration organization from the staff of CRINC, members of the former office of Research and Graduate Studies and members of the University's financial services office who had supported sponsored research projects.

Mobilizing Resources to Advance the Research Mission

The administrative reorganization catalyzed by Hemenway's arrival raised the stature of research and helped to streamline the research administration functions of the university. Several other strategic changes created the environment in which the potential created by these changes could be realized. The first was Hemenway's decision to change the way in which the University handled the

indirect cost payments that were received on federal grants.[24] In the past these funds had been applied to cover operating costs of the university, but Hemenway chose to transfer these operating costs to the base budget and to use the indirect costs strategically to support research activities.

While a portion of the indirect cost funds were returned directly to the academic units or research centers where research was carried out, the bulk of the funds were received by KUCR and used to cover research related expenditures. Rising research volumes, and hence rising indirect cost recovery, thus helped to fund increases in research administration staff, cover the start-up costs for new faculty, purchase research equipment, pay for maintenance of research space and, eventually, pay the interest costs of bonds issued to pay for the construction of specialized research space on the West Campus.

One of the ways Barnhill utilized these resources was to encourage faculty to pursue larger, multi-investigator projects. Barnhill consciously sought out faculty he thought were well suited to lead such projects and provided encouragement and support needed to pursue these larger scale projects. These investments resulted in a rapid increase in the number of large grants secured by the University. In addition to the support for the Center for Remote Sensing of Ice Sheets described earlier, among the first of these large awards was a $10 million NIH Center for Biomedical Research Excellence (COBRE) award that was at the time the largest single award

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[24] Formally these payments are referred to as Facilities & Administration costs. For Federal grants they are calculated as a percentage of the direct costs of conducting the research. The rate used for these calculations is determined through a lengthy process of negotiation with accountants from the Federal Government based on University costs and research expenditures.

received by the University, and an award from NSF's Engineering Research Centers program to support the establishment of a Center for Environmentally Beneficial Catalysis led by Bala Subramanian and Daryl Busch.

Working with the Board of Regents, the Governor and Legislative leaders, Hemenway was also able to secure passage of legislation that allowed the state's universities to retain tuition revenues rather than, as had been the case, having these payments go directly into the state General Fund. With the passage of "tuition accountability," the University initiated a program of tuition increases, targeting much of the additional funding to support the hiring of 100 new faculty positions. The additional faculty positions were allocated to enhance research strengths in four broad areas of focus that had been identified as part of a campus-wide planning process.

Research at KUMC

Paralleling the changes on the Lawrence Campus, Hemenway also embarked on a set of initiatives intended to revitalize research on the Medical Center Campus. One of the first steps in this process was to separate the management of the KU Hospital from the Medical School. As with tuition accountability, this separation required approval in the legislature, and Hemenway worked closely with Governor Bill Graves to craft legislation that would establish a separate hospital authority. Once management of the hospital was insulated from state oversight, it could begin to make the management changes needed to increase efficiency, and raise revenues

needed to modernize. Meanwhile KUMC administrators were freed to focus on enhancing the research and educational missions of the school.

Importantly, early in his tenure Hemenway committed the university to the goal of achieving Comprehensive Cancer Center designation from the National Institutes of Health, making it the top priority not just for KUMC but for the university as a whole. The decision to focus on cancer as a priority was important because it cut across departments and units within the medical school and could thus be a focus for raising research activity across the board. At the same time, it provided a vehicle to strengthen ties between researchers at KUMC and those on the Lawrence Campus since KU's strengths in drug discovery and development provided a distinctive focus for the Cancer Center project.

Barbara Atkinson, who came to KUMC as Chair of the Department of Pathology and Laboratory Medicine in 2000 emerged as a leader of the efforts to increase basic science research on the KUMC campus. In 2005 Atkinson replaced Donald Hagen as Dean of the Medical School and Executive Vice Chancellor. At about the same time Atkinson assumed leadership of the KUMC Roy Jensen assumed overall leadership of the Cancer Center initiative.

Although he had grown up in Kansas, Jensen's only connection with KU to that point had been through attending Ted Owens' Basketball Camp when he was a high school basketball player. Importantly, however, Jensen had been on the faculty at Vanderbilt University Medical School when it was building a Comprehensive Cancer Center and had a good understanding of what was required to build a successful program. Because of his expertise Jensen emerged as a natural choice to

lead the Cancer Center initiative when Bill Jewel, who had been organizing the effort, announced his plans to retire.

In one sense, the acceleration of KU's efforts to secure Cancer Center designation and Jensen's appointment could not have come at a worse time. Over the previous five years the National Institutes of Health had pursued an aggressive expansion, doubling the amount of funding for biomedical research. This expansion came to an end in 2003, triggering a much more competitive national environment for research funds. KU's Cancer Center initiative, however, coincided with a significant state investment to promote biomedical science. In 2004 the legislature passed the Kansas Economic Growth Act, which established the Kansas Bioscience Authority (KBA) and dedicated a stream of tax revenue to promote bioscience based economic development in the state. At the same time Governor Sebelius added a line item for the KU Cancer Center, providing $5 million in funding annually.

From its establishment in 2004 through 2013, the KBA provided the KUMC with close to $50 million in funding to help recruit both established researchers and rising stars who would enhance KU's cancer research efforts. In addition to the substantial state investments that the Cancer Center garnered, the regional benefits of Cancer Center designation helped to elicit substantial philanthropic contributions from the greater Kansas City community. In all, close to $350 million was invested in the effort by the time the National Cancer Institute announced the Cancer Center designation in June 2012.

Bold Aspirations….for the Future

Expanding the frontiers of knowledge is necessarily a dynamic activity requiring continued adaptation and adjustment. While the basic outlines laid down by Chancellor Hemenway, and institutionalized by Vice Chancellor Barnhill have persisted since the late 1990s, one mark of their success has been their ability to accommodate and, indeed, facilitate the changes necessary to keep pace with the changing demands of the University's research mission.

On the Lawrence campus, when Bob Barnhill stepped down as Vice Chancellor for Research in 2003 he was replaced by Jim Roberts. Roberts, a Professor of Electrical Engineering who had been Associate Vice Chancellor under Barnhill, stepped in first in an interim role and then, after the completion of a national search, was appointed in his own right. Under Roberts KU embarked on a significant expansion of its West Campus research facilities. Major elements in this new research campus included the 106 thousand square foot Multidisciplinary Research Building, dedicated in 2006, and a Structural Biology Complex built in stages between 2004 and 2006. As was the case with several new research buildings erected on the KUMC campus, the financing of these buildings followed a new model in which the state used its bonding authority to allow the University to issue bonds, but funds to repay the bonds were to be generated from research overhead produced by researchers using the new facilities.

In 2007, Roberts returned to the faculty and was replaced by Steven Warren, who had been recruited to KU from Vanderbilt University in 2000 to be the Director of the Life Span Institute. One of Warren's major initiatives has been the expansion

of the University's technology transfer programs. In 2008, Warren and Paul Terranova, Vice Chancellor for Research on the KUMC campus, established a unified technology transfer program for both campuses. Soon thereafter the KU Center for Research began construction, of a business incubator building, the Bioscience & Technology Business Center (BTBC) to facilitate commercialization of KU technological innovations and facilitate collaboration between KU researchers and industrial partners. Opened in 2010, on the West Campus near the Multidisciplinary Research Building, the BTBC's 20 thousand square feet of office and lab space were quickly filled, and work began on a second phase.

In 2010, following the appointment of Jeff Vitter as Provost and Executive Vice Chancellor, the University embarked on a major strategic planning exercise. "Bold Aspirations," as it was titled, encompassed almost all aspects of the University's operations, but a significant theme in the planning process revolved around identifying the university's research strengths and developing a more cohesive strategy of investing in and leveraging these strengths to enhance its research profile. As the result of a year-long process that began with more than 100 research initiatives proposed by individuals and groups of faculty the University identified four broad, overarching research initiative themes around which faculty recruitment and investments would be focused.[25] It is too soon to judge whether these new inter-disciplinary initiatives will significantly reshape KU's research

[25] These themes are: Sustaining the planet, powering the world; Promoting well-being, finding cures; Building communities, expanding opportunities; and Harnessing information, multiplying knowledge. See http://www.provost.ku.edu/strategic-plan, accessed 17 January 2014.

mission in the future, but since their selection in 2011 they have stimulated an ongoing conversation within the university community.

Forging a Research Mission

With the emergence of the information economy over the past half century, scientific and engineering research have become increasingly important drivers of economic growth. One important consequence of this transformation has been a substantial growth in the volume of university research and development activities. Since 1957, when funding growth began to accelerate, federal research and development funding for colleges and universities increased at four times the rate of growth of national income, rising in constant (2005 prices) from $1.4 billion to $34.9 billion by 2011. This increase in research effort was accomplished by a significant expansion of the nation's research capacity beyond the small cadre of elite universities that had dominated scientific research through the 1950s.

The evolution of research at KU is the local reflection of a process that took place nationally as a growing number of the nation's universities became involved in sponsored research. As we have seen, there has always been a strong commitment at KU to advancing the frontiers of knowledge. And over its first century the University had developed a number of research strengths, especially in areas with salience to the state's population and state government. In addition, individual faculty members carried out programs of scholarship in their own field of expertise.

The research interests of the faculty continue to be important in the aggregate, but are so varied that they cannot be easily summarized or described.

Against this background, however, in the past 50 years the University has seen the expansion of a number of lines of research in which KU can claim leadership nationally and internationally—the most prominent of these being applied behavioral science, drug discovery and development, and remote sensing. These strengths have, in turn, been important in supporting the University's entry into related areas of research such as special education and cancer treatment. The defining feature of each of these research areas is that they have grown well beyond the scope of a single individual's research, and require specialized research space, equipment and a cadre of personnel to support them. Supporting these research capabilities in turn has required development of the administrative and leadership capabilities to compete for and manage the sponsored research funding that these activities require.

The foundations of these areas of research leadership were laid in the late 1950s and early 1960s through a series of recruitment and retention decisions. At least in retrospect the decisions to recruit Tak Higuchi and Richard Moore, and the effort to retain Richard Scheifelbusch appear remarkably prescient and forward-looking. We cannot, of course, know what expectations senior administrators had at the time they made these decisions. Similarly, it is difficult at this distance to know what other recruitment efforts were undertaken but did not turn out to be as effective. What is clear is that at its root the research mission of the university is built on hiring and retaining the right people. Less obvious, but equally true,

success in research requires providing the resources that these individuals need to do their work.

From the mid 1960s through the mid-1990s, KU's research profile was largely driven by the legacy of these earlier choices. New initiatives, such as the Center for Research on Learning, and the School of education's prominence in special education grew in part from these strengths. Not until the arrival of Chancellor Robert Hemenway in 1996, however, did KU's senior leadership focus attention on the health of the research mission in a concerted manner. The organizational changes put in place at that time have enabled a second surge of growth in the university's organized research efforts.

Sponsored research expenditures are, of course, just one reflection of the university's research activity, and do not adequately capture faculty research in the arts, humanities and many of the professional schools. Nonetheless they do serve as a marker of the level and nature of activities in the sciences that have been the focus of much of this history. Figure 2 traces the history of KU's research activity by plotting the fraction of all federally-funded university research expenditures that is accounted for by KU from 1973 (the first year for which there are data) to 2011.

From the early 1970s KU's share of federally-funded research expenditures dropped sharply until the late 1970s when it stabilized. Despite some variation in subsequent years there was no sustained upward movement until the 1990s, and especially after 1995 one can see a recovery of research funding numbers corresponding to the administrative and strategic changes put in place by Chancellor Hemenway. Although KU's growth in the share of total research

expenditures leveled off after 2000, it has continued to climb in rankings relative to other national public research universities. By 2012 it ranked 38th in this group, an increase of 17 places in the 17 years since 1996, when it had been 55th. Thus, while KU is not positioned to enter the top tier of research universities, it has successfully created the infrastructure to sustain a competitive position among the nation's research universities.

Acknowledgments

Much of the material in this chapter was gleaned from interviews I conducted with a number of participants in the events described here. I would like to express my profound appreciation to the following individuals who spoke with me about their roles in the history of research at KU: Barbara Armbrister, Robert Barnhill, Richard DeGeorge, Jay Darnell, Don Deshler, William Duellman, Prasad Gogineni, Frances Horowitz, Roy Jensen, Kim Moreland, Howard Mossberg, Del Shankel, David Shulenberger, Val Stella, Deb Teeter, Paul Terranova, and Linda Trueb. I would also like to thank George Wilson, Kevin Boatright and Steve Warren, as well as the editors and the authors of the other chapters of this volume for their perceptive comments on earlier drafts of this document.

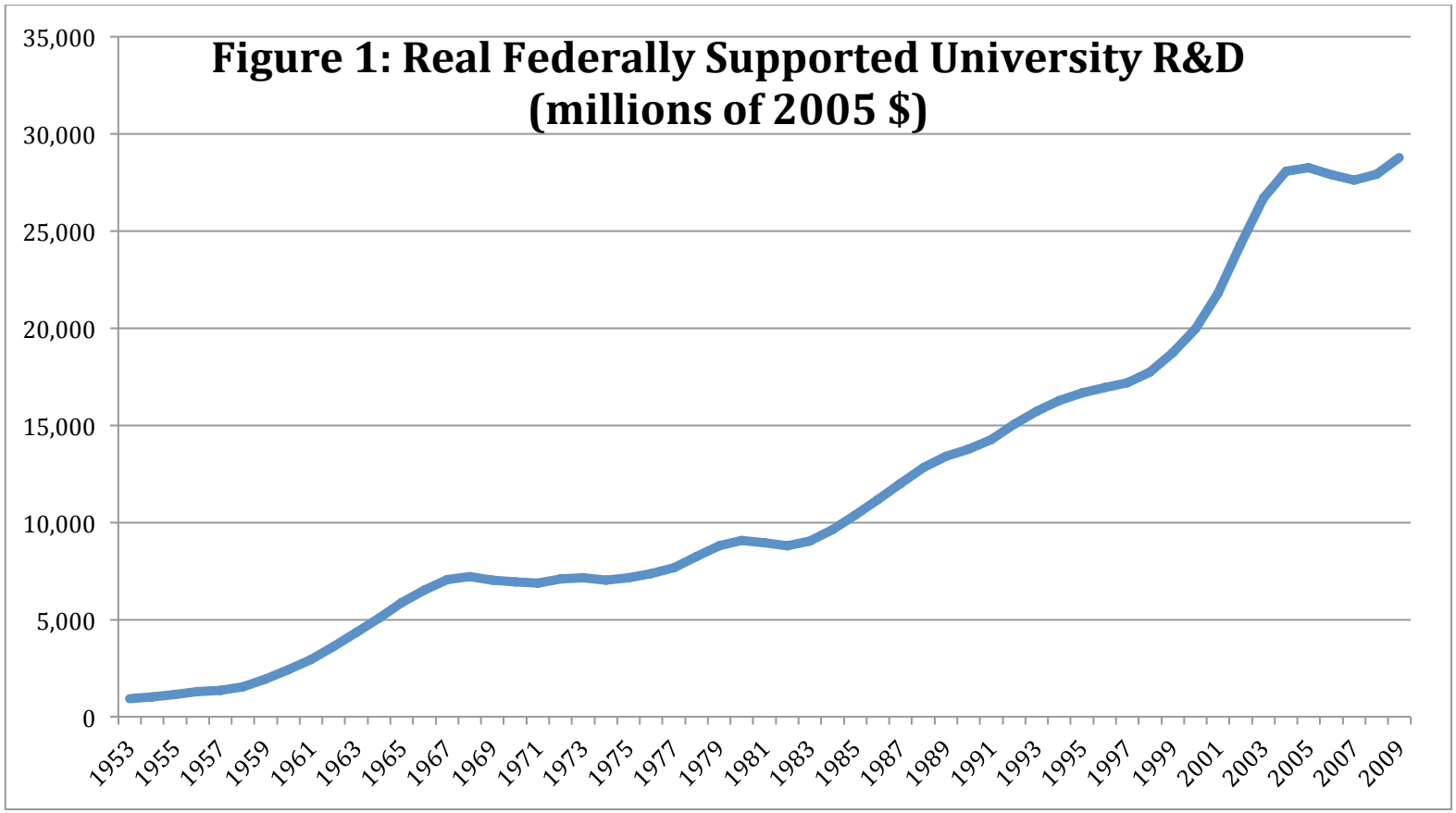
Figure 1: Real Federally Supported University R&D
(millions of 2005 $)
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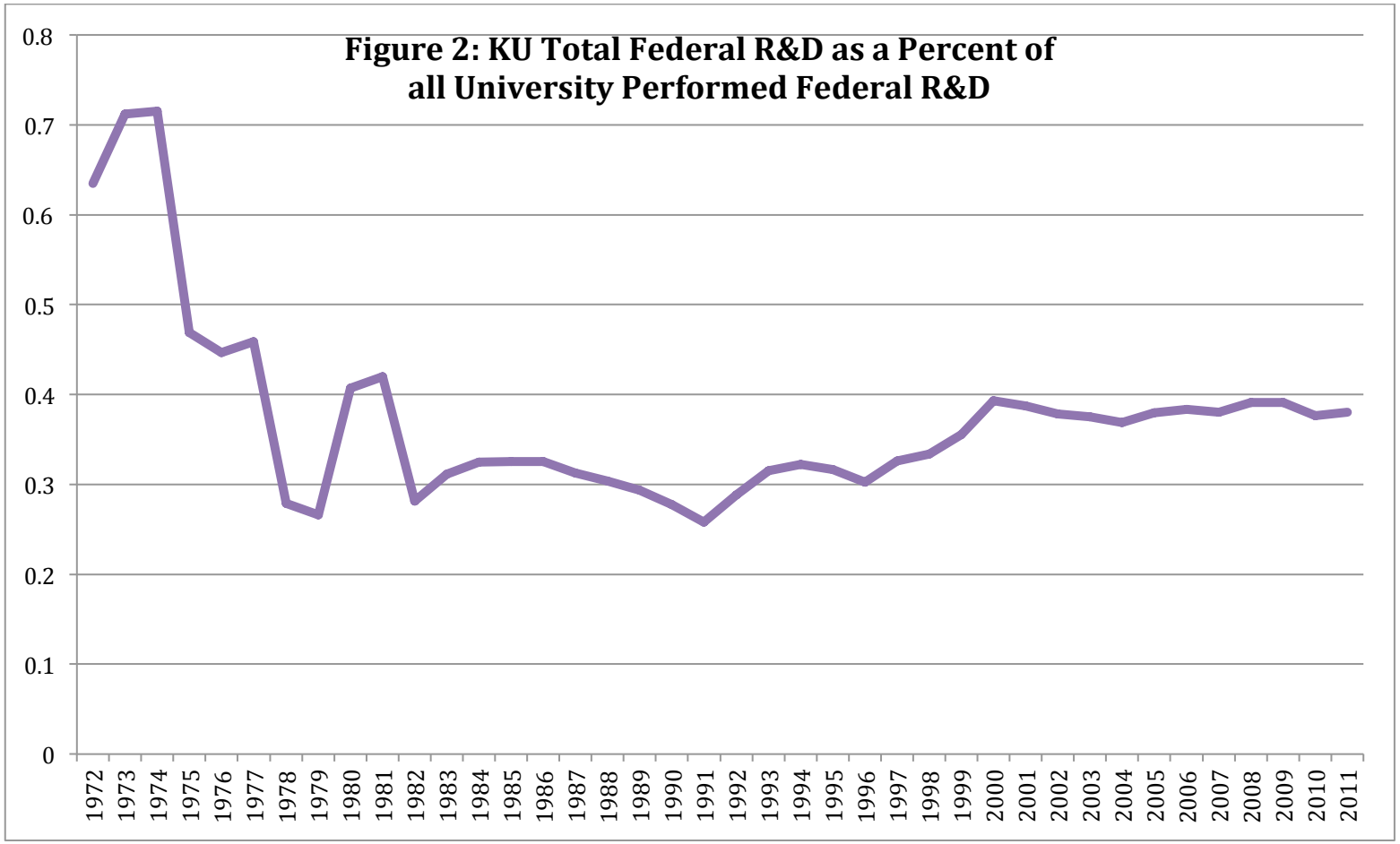
Figure 2: KU Total Federal R&D as a Percent of all University Performed Federal R&D
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