

## ***RESPONSE***

### **TO THE KEYNOTE ADDRESS**

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Our keynote speaker, Mike Crow, encourages us to think strategically, but only after we have made a situational analysis of our own institutions. We are to think of ourselves as architects, as designers.

He raises five issues today:

1. Institutional evolution is an ongoing process.
2. Variation, not replication, is the key to the university's survival.
3. Regional character, regional distinction of institutions is important.
4. Universities will move into the central role of societal transformation, primarily through their graduates.
5. Forces of change in the national research system are dramatic and are caused by a concentration of economic forces.

What might we do to respond to these issues? Dr. Crow suggests the following:

- Build a strong foundational academic core at each university.
- Identify niche areas for research focus. Each institution should identify large scale integrating problems that catalyze many faculty.
- Take more risks in order to move in these new directions.
- Cover subjects cooperatively with other institutions.

At this session there has been considerable misunderstanding of Dr. Crow's phrase "niches." Most of these difficulties can be avoided by defining "niche" as a unique area of distinction, a focus on research strength. The challenge to the university is to pursue niches that fit its institutional and regional character and possibilities. His examples of niches included the Columbia University Earth Institute and Photosynthesis Center and the planetary model theme at Arizona State University.

An example of an emerging niche at the University of Kansas (KU) might be called "quality of life." This niche combines aspects of the three largest Lawrence centers, the Life Span Institute, the Higuchi Biosciences Center and the Telecommunications Center—each represented at this workshop—as well as the focus at the KU Medical Center on the treatment of specific diseases and health care management. We observe that this theme fits well into Chris Freeman's three phases of science policy cited by Dr. Crow: 1) military, 2) commercial, and 3) comprehensive. The comprehensive phase constitutes the national objective to use science and technology to improve life.

Expanding on Dr. Crow's comments, we must emphasize *collaboration*, both within institutions and across institutions. Different strategies are needed for successful collaboration in these two contexts. At KU we are pursuing both kinds of collaboration. A situational analysis is necessary for each.

A first step in performing a situational analysis is to inventory the campus' research capabilities. Thus, even before arriving in Lawrence last year, I asked for lists of the top externally-funded researchers and the top externally-funded departments and centers. We found that, based on expenditures over fiscal years 1993-97, the top ten units produced about 60% of the total, and the top 25 over 80%. This type of information is important both for internal planning and for external communications to other institutions. For example, Jack Burns at the University of Missouri and I have been discussing our campus' respective research strengths as a basis for possible collaboration. My list compiled according to the criterion of external funding provides a brief, coherent, and useful basis for collaborative discussions.

As Steve Schroeder reminded us yesterday, institutional imprimatur can significantly aid individual research teams. It is especially important that inter-institutional contacts be made at all levels of the institutions—that high level institutional support for research collaboration be clear. This argument reinforces the need for leadership at all levels.

One practical implementation of Dr. Crow's comments about regional alliances would be to begin to create a strong and viable Midwestern "four corners" collaboration. This proposed collaboration would involve the senior research officers at the three universities represented today (Kansas, Nebraska, and Missouri) and to complete the quartet, Iowa State. An early item on the agenda would involve meeting at each institution in turn to learn more about collaborative possibilities. The time is right for change, for the creation of larger collaborations—and the presence of new players in some of these senior positions may help facilitate new endeavors.

Another example of regional collaboration is the Experimental Program to Stimulate Competitive Research (EPSCoR). Ted Kuwana, the State of Kansas NSF EPSCoR Director, mentioned yesterday the Great Plains Network linking the Dakotas south through Oklahoma plus Arkansas in an INTERNET II collaboration. A necessary

condition for any university to be a future research player is adequate connection to the Internet and the Great Plains Network is a regional response to this common need.

Dr. Crow emphasized yesterday the “parallel process model of technology development.” (See his slide on the Columbia Research website.) This is an provocative model. It expands Pasteur’s quadrant by adding a technology base to the scientific base in Stokes’ original formulation. Each may be thought of as examples of Pasteur’s Quadrant with the respective independent variable of basic science/applied science and basic technology/applied technology. The next step is to think of a four dimensional “Pasteur’s Hyperquadrant” with the above four independent variables.

We have heard here several examples of Pasteur’s Hyperquadrant:

- Jack Burns spoke of a regional alliance involving the University of Missouri, Washington University, Monsanto, and the Missouri Botanical Gardens in a Plant Science Center. This is designed to be a “virtual coloboratory” and an incubator for biotechnologies, with telecommunications as a future possibility.
- Victor Frost, University of Kansas, reminded us that nationally a fourth of the real economic growth in the USA from 1993-98 has come from information technology and the Internet. Dr. Frost’s work in telecommunications research and development covers several aspects of Pasteur’s Hyperquadrant. His efforts involve collaboration between KU and Sprint, a Kansas company, with federal support from the NSF, DARPA and the Department of Defense.

Dr. Crow yesterday quoted Roger Noll’s thesis that a (relative) decline in federal funding will favor the elite universities, and second tier institutions will be forced to seek industry funding to support their research. As federal funding shrinks, therefore, we see that it will become doubly important for smaller universities to combine forces to compete with the elite universities. These combinations may be among universities or may involve universities with other partners, but macro-level teaming seems the clear road to successfully competing for future federal funding.

I would like to conclude my response to Dr. Crow by listing the six questions he left for us to ponder. These were sub-topics within his overall question: How do you begin thinking about organizing collectively?

1. What is the substantive vision (for the region and for universities)?
2. What niche is each institution willing to fill?
3. What complementarities exist that could be exploited?
4. What new governance and business models will permit this?

5. How can business stakeholders be integrated into significant settings?
6. What will the new federal/state/institution relationship look like?

Dr. Crow reminds us that we are architects capable of designing our institutions. He leaves us with the paramount challenge to determine what our goals are and the processes by which we will achieve them.