TRIBUTE TO GOBIND KHORANA, AUGUST 2009

Prologue: "Just Connect"

In this Symposium, we honor the signal contribution of Gobind Khorana in **connecting chemistry to biology** through the first *de novo* synthesis of a gene. This achievement built a substantial bridge between these two disciplines.

Throughout the Symposium, we marvel at the interesting and heavy traffic that has crossed that bridge. The myriad scientific achievements include both *tours de force* of chemical synthesis and new understandings of the molecular basis of particular biological processes such as transmembrane signaling.

I could say a lot tonight about Gobind Khorana and the history surrounding him. So do most of the speakers in this remarkable Symposium. But my wife Alexandra has given me this advice:

Start somewhere near the end.

Thus, contrary to the written Program, I do not intend to give an After Dinner Talk. (As scientists, we always question what we see in print.) Instead, I intend to give a Tribute to Gobind Khorana. I call this tribute "Gobind's Bridge." This Bridge represents much more than a pathway of science. We each appreciate many other ways in which Khorana connects with our individual worlds. My comments this evening deal largely with the world of Wisconsin, which you can see from my biosketch is the focus of my professional and personal life.

- What cluster of research activity at Wisconsin was drawn together by him?

In 1959, the Nobel Prize in Physiology or Medicine was awarded to Edward Tatum, George Beadle (the chair of Biology at my graduate school, Caltech, and Joshua Lederberg, who had just left Wisconsin for Stanford. *Tell story re Beadle ("had all the questions") and Lederberg ("had all the answers").* Gobind was one of the dozen molecular biologists hired into different departments in the early 1960s to replace the departing Lederberg. I think of this group as Wisconsin's "Dozen Answers". Gobind, placed into the Enzyme Institute, nonetheless crossed the campus daily. In particular he regularly supported the "Thursday Night Nucleic Acids Group" that I coordinated over the last half of the 1960s in the McArdle Penthouse. This group fostered the formative years of The Dozen Answers, a group came over time to spawn a number of members of the National and American Academies of Science and three Nobelists. In his ten years on the Wisconsin faculty, Gobind Khorana was not only a research dynamo, he was a university citizen.

More than science

- What architectural feature of the Madison campus was stimulated by Khorana's urge to connect with the University?

The Alicia Ashman Bridge…

- How did Gobind connect the two Wisconsin lifestyles: the university and city of Madison *versus* the rolling countryside surrounding us?

One wonders how over the 1960s Gobind was able to write more than one hundred research articles for JBC on the synthesis of nucleotides and polynucleotides. Perhaps the answer lies in his tradition of disappearing from the dynamic laboratory, university, and city to the surrounding countryside to write. Usually Gobind and Esther would retreat to the Karakahl Inn in Mt. Horeb.

- Khorana moved from university to university – Birmingham to British Columbia to Wisconsin to MIT. What is the nature of his institutional loyalty?

More than one speaker has cited Khorana's announced reason for leaving Wisconsin in 1970: that to remain fresh in science, it helps to change institutions every ten years. Indeed, we have seen in the Symposium how fresh his science has remained. That said, we also know that Gobind Khorana has remained fiercely loyal to his institutions and his erstwhile colleagues, including the University of British Columbia and Wisconsin. Julius Adler's talk illustrates that, as does the experience of those of us who have visited MIT in the past several decades. The new Khorana Scholar Program between India and Wisconsin perpetuates this facet of Gobind's Bridge.

- Finally, what forces in Gobind have built and maintained these bridges?

Gobind's scientific bridge has been built by an intense ability to select a core problem and to work hard on it. He has maintained this scientific bridge but also his loyalty to colleagues and institutions through a steeltrap memory. Just this noon, Gobind, his daughter, and Tom Rajbhandary tracked me down in the reception area. Gobind recounted with delight how he had driven from Vancouver to Seattle to hear a lecture on What is Life given by my senior McArdle colleague Van Potter.

Gobind, we shall always remember your time with us. I am confident that the same can be said for everyone in this room.

Epilogue:

My comments this evening began with a story on the theme "Just Connect." And that is how it now ends. I want to leave you time this evening to connect with the friends, vintage or new, who have come together for this occasion. Enjoy your time together!