BioVision Alexandria 2004:
Remarks at the Closing Plenary
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As we draw this fascinating conference to a close, I would like to thank our host(s) [Ismael Sergeldin and ??] for not only the wonderful hospitality that they have afforded us, but also for the very idea of this conference, in this city. As I have listened to the quality of presentation and the debate over these past days, I have drawn a special feeling of connection to the great tradition of learning that first flourished in Alexandria millennia ago, and continues today. I am proud to survey the future of the life sciences from this vantage point, and engage such distinguished colleagues over what we will make of the incredible opportunities arising from progress in the biological sciences. I am also especially satisfied to feel that this city, this country, and this continent, which is my continent, will draw on the strength of its tradition to launch into the 21st Century with the highest aspirations for intellectual achievement and intellectual leadership.

The conference has been distinguished by the scope of its ambition. We have come together at a time when half of the world's six billion are in poverty, and more than 1 billion people are in extreme poverty.[1] We are conscious that 800 million people remain food insecure. This conference takes place against the backdrop of a world in which the international community has pledged itself to meeting the Millennium Development Goals by 2015. Most importantly, perhaps, the conference acknowledges that the impact of science on poverty will be a result of the forethought we have and the efforts we make to ensure its meaningful incorporation into policy decisions.

While we have acknowledged the global trend toward rising incomes, and the positive impact this will have in the developing world, we know that economic growth alone is not the answer. Especially in areas where science has the greatest impact – health, food security, and environmental sustainability, the increased incomes that are predicted in the developing world will not by themselves be sufficient to allow countries to meet their MDG targets for such things as child mortality or reversing the spread of HIV/AIDS.[2] This conference has endorsed the ethical responsibility of the science community to look forward and act in ways that bring the benefits of our expanding knowledge to the world's poor people.

We already have too many example of technological marvels that are, at best, ethically neutral. We need more innovations that not only show our mastery of nature through knowledge, but affirm our concern for human rights and dignity. And let us not settle for progress that increases comfort for one segment of humanity unless we also see progress that increases hope for all.

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[1] Defined as living on $2/day and $1/day respectively. See World Bank, "Making Services Work for Poor People: World Development Report 2004" Oxford University Press, p.4

[2] Ibid., p.2

In choosing to entitle this gathering "**BioVision** Alexandria" our hosts have given equal emphasis to the contribution of the life sciences and the vision we have of the difference they can make through social applications. My colleagues this morning have done an excellent job of drawing conclusions and formulating recommendations from our discussion. They have captured key ways in which the life sciences will impact human health, food security, biodiversity and the environment, and trade and economic considerations […..perhaps add some thoughts here regarding the conclusions and recommendations from the earlier session].

As we bring this conference to a close, I am struck by the diversity of perspectives that we have been able to include over the past few days. As I have listened and participated over the past few days, the questions we have dealt with here have resonated with past and present aspects of my career personae. The physician in me feels the giddiness of new cures, and cringes at the inequities in the way they are developed and the deficiencies in which treatment is allocated. The activist cheers the victories in the struggle for cheaper anti-retrovirals, and rails at the fact that a negligible percent of pharmaceutical research focuses on the tropical diseases that kill so many in the developing world. The university Vice Chancellor marvels at the new potential opening up for faculty and students, but shrinks from the complexities of attracting and retaining the best people under the changes wrought by globalization.

When I consider the likely impact of the biosciences for the future, however, it is the anthropologist and the development policy makers who get most stirred up. In fact, I would propose that the first questions we need to ask in analyzing the impact of "the new biology" are: (i) how well do the social sciences serve as a bridge between advances in the biology and policy? And; (ii) what complementary knowledge and skills will allow scientific knowledge to appropriately guide social policy?

As the advanced state of our current knowledge in the life sciences creates more technical solutions for the problems of poverty, it drives us toward more elusive questions in the domain of social and information scientists. For example, the science behind oral rehydration is clearly understood. The challenge now is to understand the factors that influence its use and the ways policy can increase successful outcomes. Much is known about the biological aspects of HIV/AIDS transmission, but how well do we understand the issues of powerlessness and exclusion of women that seem to be the critical determinant of new infections? As genetically modified organisms increase the potential for new systems of micronutrient delivery, what will determine who takes advantage of these and why?

The World Bank is fond of saying that progress against poverty is greatest in countries that have "good policies." Leaving the tautological aspects of this remark aside, what I believe my economist colleagues mean to express by this statement is that progress against poverty is greatest where policy-making is pragmatic and evidence-based, and where it is informed by reliable data and information. Put another way, policies are most effective when social science has become a bridge between experience

and legislation. Politics is a messy business, but a culture of social science creates ground for political discussion in a way that greatly increased the chances of successful policy outcomes. Our technological optimism should be tempered by the realization that effective policy formulation calls for a critical mass of expertise in the social and information sciences as well as natural science. Moreover, as important as global expertise is, nothing is as powerful for local problems than local expertise with a global perspective.

Where will we find this local expertise with global perspectives and knowledge? Quite simply we must create it throughout the developing world in vastly greater quantities than we currently do. Over the next two generations, over 90% of population growth will take place in the developing world. The urgency which science uses to accelerate the rate of discovery needs to be harnessed to ensure that its human resource base is made broader and deeper in the parts of the world that need it most. If the conditions can be created where one or two percent of the futures young people have the chance to embrace science as a career, the way the young in OECD countries do, we will be mixing much more hope into the wonder that new discoveries bring.

As we prepare to leave this city, let us draw from its past the inspiration for a future where knowledge and its benefits are shared equitably worldwide. For much of the present era, we have grown used to a world in which the most advanced scientific knowledge is concentrated in a small number of countries, many of whose social inheritance was greatly influenced by Western Europe. Until recently, it was too often taken for granted that doing first rate science meant physically moving to one of these countries, depriving one's native land of the stabilizing influence that an additional great intellectual can bring.

But our cultural memories are short, and we forget that the early intellectual figures of the Western European tradition came to Egypt to get access to advanced knowledge. The Greek Philosopher Plato, dismayed at the political instability in Athens that led to the execution of his teacher Socrates, came to this land around 390 b.c. in what might be described as a prototypical post-doctoral fellowship, or ancient equivalent of a "sandwich" study program. When he return to Athens years later, he penned an account of the debt that Athenian Civilization owed to Egyptian science and learning. He related how Solon, the Great Athenian Lawmaker, also came to Egypt seeking wisdom and learning. The oldest priest of the city of Sais chided Solon, telling him the Greeks would always be like children because they were unable to preserve the learning that the gods had bestowed upon them.[3]

I personally know a bit about the dangers that ensue when one culture feels intellectually superior to another, but, in this case the Egyptian priests sought not to humiliate the young Athenian but to share knowledge with him. He tells Solon that their two great cities are connected by a glorious and shared intellectual past, wherein they used knowledge to build civilizations that excelled all others in virtue:

[3] Plato, "Timaeus" paragraph 22 b. Translated by Benjamin Jowett in Plato: The Collected Dialogues, Hamilton and Cairns, editors, Bollingen Series LXXI, Princeton University Press, 1982., p. 1157

> Our laws from the very first made a study of the whole order of things, extending even to prophecy and the medicine which gives health, out of these divine elements deriving what was needful for human life, and adding every sort of knowledge which was akin to them. [24c].

As a scientific discipline, health has done much better than prophecy in the ensuing two and a half millennia. But what we are doing today in Alexandria is in the spirit of what the Priest of Sais and the Lawgiver of Athens did here in antiquity: looking to the order of nature, selecting what is needful for human life, and struggling to have this guide the laws of our lands. Solon listened well in Egypt, and his ability to transfer and adapt this knowledge brought countless advantages to Classical Athens and the civilizations that followed it. As we return home, let us draw once again on this ancient Egyptian wisdom so that science may bring "what is needful for human life" to wherever it is lacking.

Thank you.