

**Banquet Speech to The Association of Egyptian American Scholars
(AEAS) Conference June 3, 2000**

In Toronto, Canada

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I am honored to have been invited here tonight to share with the Association of Egyptian-American Scholars the dreams of an Egyptian renaissance. Our dreams. More importantly the dreams that animate each and every one of the millions that identify themselves as Egyptian and Arab, for Egypt contributes mightily to the whole Arab world, and the world at large.

There is a special reason to consider this meeting and this group as especially pertinent to discuss such a dream. For it is this group and others like it that have a primary responsibility to define the dream and to transform it into reality.

The Association is an association of intellectuals. And my thesis tonight is that it is the task of the intellectuals, here and in Egypt, to trigger that renaissance. Perhaps more than most of our colleagues in Egypt, we, here in North America, have greater freedom from the demands of a grinding daily life or the pressures of an intolerant fanaticism that surround the activities of the intellectuals in Egypt and much of the Arab world today.

Allow me to address five themes tonight:

First: The changing world and the new “knowledge economy”, and the special position of Science and Technology within these changes.

Second: Why we must become “learning nations”, and what Egypt must do to become such a “learning nation”.

Third: Adoption of the Scientific method and the values of science, which are, to me, an essential task for the liberation of the Egyptian mind. Liberating intellectual inquiry and artistic imagination to create a new Egyptian renaissance.

Fourth: The role of the intellectuals in inventing the future. This is linked to what the broader intelligentsia is doing to create the mirrors in which we see ourselves and the windows through which we see the world.

Finally: I want to invite you to share with me the dream of what can be, if only we dare to dream.

The World Today: Global Contradictions

Consider the paradox of our times. We live in a world of plenty, of dazzling scientific advances and technological breakthroughs. Adventures in cyberspace are at hand. The Cold War is over, and with that we were offered the hope of global stability. Yet, our times are marred by conflict, violence, debilitating economic uncertainties and tragic poverty. And now so many of the rich want to turn their backs on the poor. Selfish concerns seem to displace enlightened self interest.

Of particular concern are the increasing inequities between societies and within societies. The citizens of the world, generally, and Egypt specifically, face the large, the new, the unknown, and feel profoundly insecure. There is very real cynicism about the ability of governments to create utopia. In a word, there is a growing sense of unpredictability about the future.

Under these circumstances, people tend to regress: if the future cannot be clearly defined as the goal, one lives for the present. If the present is troublesome and disconcerting, one falls back onto the past. The past here means one's ethnic or religious or cultural or national roots. It is a drawing closer of the circle within which one can feel secure. A regression back to the concept of tribe and clan.

Egyptian society, and more generally the Arab societies of today, are the crucible of all these forces and fears. They want to define themselves in terms of the present and the future, retaining their links to their heritage but without remaining captives of the past. Some, however, regress into the past and want to lock out the present and the future.

But that is only the negative side of the picture. Humane values have spread everywhere, and the respect for human rights, however haltingly, is gaining ground every day. The demand for the right of participatory citizenship is also spreading everywhere. Environmental awareness, our interconnectedness with nature and the consequences of our actions is also spreading. But the most exciting changes of all are the scientific and technological revolutions that we are living through.

For we do live in exciting times. The world is changing as never before, driven by not one but several true revolutions of global scope.

First, is the communications revolution. True, the planet is becoming smaller, and we are moving towards a global village. But, the same inequities that haunt the economic sphere are also here: The

World Bank estimates that only 40% of humanity has actually ever made a phone call! Much less is this vast bulk of humanity equipped to participate in the rest of the communications revolution, from the Internet to the wireless explosion.

Second, is the information revolution: Ever faster, cheaper and more reliable, the computer revolution driven by Moore's law (the power of computers double every 1-2 years and the price drops by half). This new power is making not only enormous financial transactions possible; it is also making the biological revolution possible.

Indeed the combination communication and informatics is so powerful and so mutually intertwined that it makes sense to refer to it as the Information-Communications Technology (ICT) revolution. It will leave no part of our lives unaffected. It is the primary force behind what has been widely recognized as the “New Knowledge Economy”.

Simply stated, the new economy will rely ever more on the ability to master knowledge rather than raw materials. It will be where the added value in economic terms will be generated, and those who learn to master these tools of the new economy will be the masters of the global economy. The great Unwashed of the 19th Century will become the great unwired of the 21st century.

Let me digress for a moment to speak of the transformative nature of the new ICT revolution.

The key to ICT is not just the wireless technology, but also and more profoundly the digital revolution. By finding the common binary language of ones and zeros, we suddenly see things that appeared impossible become possible and the possible become commonplace. Boundaries are erased, telephony not only becomes mobile, but links to the internet. Television, computers and telecoms become one. Image, music, data and voice are all binary bits that can be manipulated and moved on a common digital mode.

This extraordinary transformative technology forced enormous changes in the businesses that functioned within each of its component parts. Mergers, acquisitions and the emergence of the new... The landscape is being transformed. The fast eat the slow. New names appear. Governments are running after the new realities trying to make the regulations meaningful in this world of dizzying change. For those in that business it is truly “change or die”!

Yet despite the astronomic numbers and wealth of the new technology companies, this technological revolution is also a democratizing one... It empowers the weak and the poor if only we have the imagination to see how the benefits can be harnessed properly..

From M. S. Swaminathan's info-villages to the inherent open access of the Internet, the forces of the civil society and of diversity find in the new technologies powerful tools to remain local while going global. The dialectics of connectedness and fragmentation can be resolved to the benefit of the poor and the environment with imagination and perseverance.

In the biological sciences, finding the common ATCG language of DNA is also wreaking transformative changes in approaches to the practice of science and what is doable.

We are living in a time unmatched for the opportunities that it provides the biological sciences. It is an exhilarating time, similar to what physics experienced in the glorious 40 years between 1905 and 1945, when all the concepts were changed, from cosmology to quantum physics, from relativity to the structure of the atoms. Today we are decoding the DNA blueprints of life, we are learning to manage the deployment and expression of genes, we are mobilizing bacteria to do our work, and we are manipulating the very building blocks of life. Like physics in the first half of this century, we are confronted by profound ethical and safety issues. Unlike prior work in biological sciences, our future research will be complicated by the new issues of proprietary science.

These revolutionary changes are undoubtedly creating enormous wealth and well-being for many, they have tended to exacerbate the inequities between and within countries. Above all, in the realm of the new knowledge based economy – inexorably pressing onto our future – we witness the emergence of proprietary science. Intellectual Property Rights (IPR) are being taken not just on products but also on all the inputs into research processes. If we in the developing countries do not actively wake up to these changes, and change ourselves to participate in this revolution, we will witness in this century the emergence of what I have referred to as Scientific apartheid !

Against this backdrop of the rapidly changing international scene where does Egypt stand? Where does the whole Arab world stand?

We are avid consumers of technology. But where are we in the production of knowledge or its mastery?

Becoming Learning Nations:

It is essential that we be able to interact with the knowledge that underlies the technology and not just manipulate its artifacts.

This premise can be elaborated on in many ways. But the simple fact is that if we do not interact with the knowledge that underlies the artifacts, the science that is behind the technological application, we will not only be unable to keep up with the changes in the scientific scene, we will also be unable to internalize the changes in our own societies. Thus it is not essential at this stage that we be major producers of new knowledge, but we must start by being able to interact with the knowledge and learn to internalize its premises and its products. This is what has been termed by some as becoming "learning nations".

Thus the three basic and immediate challenges are:

- Understanding the multiple revolutions: ICT, biology
- Keeping up with the fast evolving developments and mastering their outputs
- Promoting Competitiveness, both technological and economic, and ensuring that the societal context leads to Egypt, and the Arab countries more generally, becoming "learning nations".

Having brought in the issues of competitiveness and effective applications of science, we must distinguish between science and technology.

- Science is the mastery of the knowledge that explains nature.
- Technology is the application of such knowledge for utilitarian ends.

At an individual level, one can certainly master technology without understanding the science behind it. Most people do not understand how the Internet works, and many persons drive a car without any understanding of how the internal combustion engine works. Yet, it is inconceivable that a society as a whole would be able to master technology for production ends without a significant understanding of the science. The dissociation is certain to lead to a society of consumers rather than producers.

This will require that we truly develop an infrastructure for Science and Technology (S&T). This S&T infrastructure is NOT an easy thing to set up. It is far-reaching and interlinked with many other institutional, socio-cultural, political and economic aspects of the context within which our scientists and entrepreneurs operate.

The Values of Science:

I know that many will say that scientific research requires massive funding. I claim that more important than money is the presence of institutionalized approaches to the practice of science, which in turn require the permeation of what can be termed the values of science.

Science requires an infrastructure that can promote not only research, but also the values of scientific research. These values are:

Truth: No scientist would ever be forgiven the reporting of false data. Mistakes in interpretation are one thing, but falsifying data is unforgiven in the community of scientists. Sir Cyril Burt was

struck down from the annals of cognitive psychology posthumously when this was discovered about his work.

Honor: The second most heinous crime is plagiarism. An elaborate system of footnotes and reference citation is maintained in the arsenal of scholarship. Giving due honor where honor is due is fundamental.

A constructive subversiveness: Science advances by having a new paradigm overthrow the old, or at least expand its applicability in new ways. Thus inherent in the scientific outlook is a willingness to overthrow the established order of thinking, or else there will be no progress.

This subversiveness goes hand in hand with honor. We do not respect Newton less because Einstein supplanted his physics. We respect each generation for their contributions. In Newton's immortal phrase: "If I have seen further than others, it is because I stood on the shoulders of giants!"

Frequently, those who come up with the new insights are remarkably young. Einstein was 26 when he wrote his five papers, and Dirac was 27 when he hypothesized anti-matter, and so on. This means that seniority cannot rule unchallenged.

Tolerance plus engagement: The very openness of science to the new, means that there is a tolerance of the contrarian view -- provided that it can be backed up by evidence or subjected to the rigorous testing of the replication and meet the Poperian falsifiability approach. This means that scientists must remain tolerant and engaged. In that sense the tolerance based on the adoption of the values of science is different from the tolerance of political liberalism, which may mask indifference to the behavior of others, dismissing them without engaging them. Tolerance among scientists requires respect for the contrarian view and a willingness to test unusual ideas against the rigor of proof.

An established method to settle disputes: scientists everywhere are willing to accept the arbitration of disputes by the testing of hypothesis and accumulation of evidence. The larger the claim, the more compelling the evidence must be. But the appeal to reason, to debate and to the rational interpretation of evidence is overwhelming in the scientific community.

Imagination: We value the imagination of those who break the mold, and open new vistas, not just those who add at the margin. Science values originality as a mark of great achievement. But originality is a corollary of independence, of dissent against the received wisdom. It requires the challenge of the established order, the right to be heard however outlandish the assertion, subject only to the test of rigorous method.

Independence, originality, and therefore dissent -- these are the hallmarks of the progress of contemporary science and contemporary civilization.

We all know that effective pursuit of science requires the protection of independence. Without independence of inquiry, there can be no true scientific research. The safeguards which independence requires are obvious: free inquiry, free thought, free speech, tolerance, and the willingness to arbitrate disputes on the basis of evidence. These are societal values worth defending, not just to promote the pursuit of science, but to have a better and more humane society. A society that is capable of adapting to change and embracing the new. A tolerant society.

If these values did not exist, the society of scientists would have had to invent them to make the practice of science possible. In medieval societies, where such values did not exist, science has been a powerful force to create them. Along with the values of science has come openness, progress, freedom and the well-being of people.

Promoting the scientific outlook:

Can such ideas resonate in a society wracked by poverty and hunger, riven by civil strife and worried about fiscal crisis? I can already hear the nay-sayers, and their emphasis on pragmatism, realism, and the urgent. But they are wrong.

Science does have the capacity to capture the imagination and to move the emotions, as Weinberg has eloquently said. We must see science as an integral part of our culture that informs our worldview and affects our behavior. It promotes fundamental ethical values. Indeed, "Those who think that science is ethically neutral confuse the findings of science, which are, with the activity of science which is not." (Bronowski)

Even more, science is itself a culture of global dimensions, or at least a cultural current that affects strongly the society where it flourishes.

It brings imagination and vision to bear on concrete problems and theoretical speculation. After all, in Blake's immortal phrase: "What is now proved was once only imagin'd." Imagination and vision are at the very heart of the scientific enterprise. Again, Bronowski put it beautifully when he said "We are the visionaries of action; we are inspired with change... We are the culture of living change."

How different is this vision of continuity with its respect for past achievements reborn in contemporary ones, from that of those militant fundamentalists who would freeze us forever in their own interpretation of the past.

We must now ask if our universities, our research centers are places where such behavior can thrive, and where the values of truth, honor, originality and tolerance that I have described are

effectively molded by teacher example and student practice. If not, then we cannot expect the scientific enterprise to thrive in these institutions.

Indeed, we must go back further and ask whether the school systems are promoting the spirit of inquiry, teaching problem solving, encouraging the challenge of established wisdom and the fostering creativity and imagination in the young. If not, then the foundations on which the universities and research centers will build will be limited and the work they will produce will be more of the journeyman variety than truly excellent science.

One can ask if we have a comparative advantage in any part of science and whether we should not just be concerned about the technological applications.

I would say that today with over 800 million pages on the internet, and over 8 billion pages expected by 2005, with connectivity and computers becoming as cheap as transistor radios and televisions, we have the opportunity of giving the best young minds the reach they need. Not all science requires huge capital costs, and some areas, such as agricultural research and environmental research are location specific. So we can indeed think of doing great things.

The ICT revolution helps. We can leapfrog some of the slavish location-specific patterns of development of science and knowledge accumulation that earlier generations had to adhere to. PCs and network hookups will be as cheap and available as transistor radios are today.

Never before has the need for the scientific enterprise of Egypt and the Arab world been greater, and never before has the potential for its success been as present as it is today.

And yet, as the world explores the marvels of the genes and breaks down the secrets of the atom and reaches to the stars and calculates the age of the oldest rocks ... Many in our world, are unable to cope, and regress, looking with suspicion on the new and trying to erect barriers to limit where minds may range...

To move to technology and its link to the economy, we can think of intermediation mechanisms. Examples abound. Specific institutes of technology can be the link between industry and research. It has been very ably done in Taiwan and Korea. But the research must be there to link to, and the values of scientific research are essential if we are to have a viable intermediation mechanism.

There are questions about proprietary research and the directions it is taking science in the advanced industrial countries that deserve a special discussion, but there will be little to discuss if the foundation of our own capacity to do science is not addressed.

The role of the intelligentsia:

Tonight, I will not spend time citing statistics or talking of economic development. What happens there will largely follow if we manage our economy and address our societal issues, but above all if we succeed in creating this infrastructure of science and technology and the permeation of the values of science that I described.

I want to talk about the need to liberate our minds, for it is in our minds that the new Egyptian renaissance will be created. And it is the responsibility of the intellectuals, all of us here and tens of thousands like us throughout the world, to liberate the Egyptian and Arab mind from the fear of intolerant fanaticism or state despotism, from the shackles of political correctness or the insecurities of being disconnected from a rapidly evolving world. We must liberate the Egyptian and Arab mind so that we can soar, take in from the new and make it our own.

That, my friends, is the true revolution, creating a new order of things. There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain of success than to take the lead in the introduction of a new order of things, because the innovator has for enemies, all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new.

But it is our destiny to have been here at this time, and we must try. For it is better to try and fail than too have failed to try.

Let us recognize that the claims of cultural specificity that would deprive women of their basic human rights, or mutilate them in the name of convention, should not be given sanction, especially by those who, like myself, are proud of their Arab and Muslim identity and do not want to see the essence of that tradition debased by such claims.

Let us recognize that no society has progressed without making a major effort at empowering its women, through education and the end of discrimination.

This is not “tradition” that is being defended, it is a distorted form of political pseudo-theological “inquisition” that is being proposed, that would limit the freedoms of the non-Muslim minorities and would circumscribe the Muslim majority within the confines of dogmas articulated by a tiny minority.

We need to respect tradition and integrate it into the present and use it as a foundation for launching a better future. We need to fashion a critical approach that interprets tradition in contemporary terms, just as the great jurists such as al-Shafei did in their day.

Indeed we need to create a new discourse, and that new discourse, critical, open and tolerant of the contrarian view, will be the basis for the creation of a mode of cultural expression. A new language that permeates the arts, letters and the public realm, that incorporates the new but anchors it in the old.

A new language, where in the words of T.S. Eliot ...

Every phrase and sentence is right
When every word is at home

An easy commerce of the old and the new
The complete consort dancing together

Every phrase and every sentence
is an end and a beginning....

Who will do all this? Who will create this new language? It is the intellectuals.

The intellectual ...is an ... “individual endowed with a faculty for representing, embodying, articulating a message, a view, an attitude, philosophy or opinion to, as well as for, a public. ... someone whose place it is publicly to raise embarrassing questions, to confront orthodoxy and dogma (rather than to produce them)...” [E.Said] ...Us!

After being cowed for more than a generation, the tide is turning... Intellectuals in Egypt are beginning to reclaim their right to be intellectuals..

The excesses of intolerance from militant Muslim assassinations of writers, editors and musicians; and state abuses of human rights, have raised awareness among the intellectuals, the nascent civil society and the public at large of the imperative to liberate both mind and tongue. The intellectuals are once again reclaiming their critical posture, their independence and their moral consistency.

So today, we – here in Toronto -- come together, to confront our shortcomings and celebrate our strengths more aware than ever of our responsibility to be the artisans of the climate necessary for the rebirth of science and thought in Egypt and the Arab world, to reclaim the mantle of the giants of the last century, Taha Hussain, Aqqad, Amin and so many more, who created a golden age of liberal thought in the first half of the last century. It is up to us, and thousands like us, to bring about this new Egyptian and Arab Renaissance.

If I focus so much on ideas and the role of the intellectuals it is because I believe that that which is, existed before as an idea. That which will be, must also be first imagined.

We are, by our thoughts, even at this very moment, inventing the future in the crucible of our minds.

But the intellectuals are not alone in this task of inventing the future. There are others, which I more broadly call the intelligentsia, who by their actions or inaction, can be stifling or supporting the creative role of the intellectuals.

The intelligentsia, which I here define as the academics, the scholars, the media the decision-makers and the role models. All those who by word and deed create mirrors in which we see ourselves, and the windows through which we see the world.

Do these mirrors show us victims, objects of hate, the instruments of god on earth, or the chosen people, or those with manifest destiny? These mirrored images of the self cannot but affect our behavior.

But they also create the windows through which we see the world. It can be a hostile world out to destroy us, or it can be a world full of promise and opportunities. These windows define our attitude towards the “other”.

It is this combination of mirrors and windows that creates the boundaries in our minds, the boundaries where the “us” ends and the “them” begins.

This view of the self and the other is at the heart of the tolerance or intolerance that will prevail within our society, it defines the realities within which the Egyptian and Arab intellectuals live on a daily basis. Beyond it, in a veneer, are the imported artifacts of mobile phones and internet connectivity. And that veneer is not a real link to the transformative technologies of the global knowledge economy of today.

Conclusions:

There is no escape from the world of these transformative technologies and vast global currents.

We must seize the momentous opportunities offered, and we here must stretch out our hands to those in Egypt that want to participate fully in the knowledge economy, those who want to promote the values of science, those who want to see Egypt as a learning nation, as a producer, not just a consumer of knowledge.

We must have the courage to seize the future and bend it our will. To fashion out of our dreams for better tomorrows the realities of a better world for our children and our children's' children.

Let us be inspired by the words of Margaret Mead:

“Never doubt that a small group of thoughtful, committed citizens can change the world; indeed it is the only thing that ever has.”

Will we have the courage and the vision to take these first steps towards creating the climate of science and thought? To establish Egypt at the forefront of the “learning Nations” of tomorrow?

Will we embrace the new, while knowing full well that today's new knowledge and new approaches raise, and will continue to raise, many difficult new questions as they answer old ones? Indeed to many in the science world, these are times where, as Daniel Boorstin once observed, the modern discoverer is rather a quester, whose achievements are measured not in the finality of answers, but in the fertility of questions.

So let us launch into this quest together, recognizing no boundaries to our drive to learn. Recognizing that from the farmer in her field to the scientist in her lab, we are all problem-inventing as much as problem solving animals. Our vision of the future must therefore be one of flexibility and nimbleness – our vision must be as open-ended as knowledge, as joyful as play, as surprising as human imagination and ingenuity, as dedicated to the empowerment of the weak as our sense of shared humanity.

This exploration, we must do in concert with our peers in Egypt and the Arab world, for we have the freedom to act that many back there lack either out of fear, or expediency or just habit. But by stretching our hands out to them, we can make a difference. Our quest can truly be enriching. This exploration, will not take us away from our roots and our experience. It will enrich it, and will in the process reinvent Egypt and the Arab world in a new and contemporary light.

In the words of T.S. Eliot:

"We shall not cease from exploring,
And the end of all our exploring,
Will be to arrive where we started,
And know the place for the first time."

And for me in making choices and decisions, it is often good to remind ourselves of the wise exhortation of the sage Gandhi ...

“Recall the face of the poorest and the weakest human whom you have seen and ask yourself if the step you contemplate is going to be of any use to that person? Will anything be gained by it? Will it restore control over life and destiny?”

So, my friends, we are at a crossroads. The pace of change is accelerating. The dramatic revolutions we are living through wait for no man and no nation. Will we recognize that the moment of decision is upon our societies? Either we will transform our outlook, adopt the values of science and become learning nations, or we will be mere consumers of knowledge and technology, falling imperceptibly but irrevocably further and further behind, watching in wonder and frustration as the gap grows wider between us and the industrialized countries just as it grows wider between the rich and the poor in our own societies.

We must recognize that the time of action is now. That there is a tide out there...

“There is a tide in the affairs of men which
 taken at the flood leads on to fortune.
 Omitted, all the voyages of their lives
 Is bound in shallows and in miseries.
 On such a full sea are we now afloat
 And we must take the current when it serves
 Or lose our ventures.”

We must by our engagement help create the “**space of freedom**” necessary for civilized constructive social discourse and essential for the practice of science, even more than the availability of money. This commitment is the only way to create centers of excellence in the developing world and to ensure that the benefits of progress accrue to all the poor and the marginalized. It is these “values of science” that can unleash the full measure of their talent and their genius. All of that however, requires liberating the mind from the tyranny of intolerance, bigotry and fear, and opening the doors to free inquiry, tolerance and imagination.

These tasks are enormous. But the longest journey starts with a single step.

So let us start.

If not us, who? if not now, when?

Thank you.