



**BUILDING  
THE GLOBAL KNOWLEDGE SOCIETY  
THE CHALLENGE AND THE RESPONSE**

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## NOTE

Dr Ismail Serageldin was invited to give a plenary lecture “Building the Global Knowledge Society” at the 2012 AAAS Annual Meeting which was to be held 16–20 February 2012, Vancouver, Canada.

Unfortunately due to the political situation in Egypt he was unable to travel, so he decided to record the lecture at the Studio of the Bibliotheca Alexandrina and make it available to the organizers of the meeting to have it run to the participants as scheduled on the set program, which was to be on Sunday 19 February 2012 at 6.00 pm.

The lecture was extremely well received and accordingly, upon the request of many, the Bibliotheca Alexandrina (BA), the new Library of Alexandria, is making the recording and the full text available.

# **BUILDING THE GLOBAL KNOWLEDGE SOCIETY**

## **THE CHALLENGE AND THE RESPONSE**

### **INTRODUCTION**

Ladies and gentlemen,

Dear Friends,

It is a great honor to address this distinguished AAAS gathering on “Building the Global Knowledge Society”, a topic very close to my heart, as I have been privileged in building an institution that aspires to be one of the participants in this Global Knowledge Society: The new Library of Alexandria in Egypt, the Bibliotheca Alexandrina, that famous Ancient Library, reborn in the digital age, at the same location where it disappeared some 1600 years ago.

I deeply regret that I am not with you in person today. The revolution in our country has unleashed enormous forces, mostly exalting and inspiring, some vicious and destructive, as when the *Institut d’Egypte*, our academy of sciences that was established in 1798, was burned to the ground and many of its books and manuscripts and records destroyed. But happily, despite wild moments and difficult episodes, thanks to the efforts of our staff, the New Library of Alexandria is back in operation, as we limit the wild urges of the few and call to the better angels of the many. I will have more to say on this in a moment.

Allow me today to cover three broad topics in these remarks:

*First:* My belief that a real Global Knowledge Revolution is underway. It will be the most sweeping since the invention of writing. It has, as far as I can see, seven pillars, and its impact will create a new world, full of promise, full of challenges.

*Second:* what are we doing, in the Library of Alexandria, to confront these challenges?

*Third:* In the revolutionary turmoil of our country, what will become of this reborn Bibliotheca Alexandrina? Will it survive?

Finally, to conclude, I will return to the idea of the *Values of Science* and how essential they are to fulfill the promise of the Global Knowledge Society we seek to build.

So without further ado, allow me to turn to my first theme, and to sketch out this profound knowledge revolution we are going through.

## **THE SEVEN PILLARS OF THE KNOWLEDGE REVOLUTION**

Humanity is hurtling into an amazing future of knowledge and communication, driven by an amazing explosion of science and technology. So, please join me in this journey of exploration into the “Shape of Tomorrow”, a world where “access to knowledge is a fundamental right and the sharing of knowledge is a fundamental duty” to quote Lydia Brito of Mozambique. I invite you to share my wonder and admiration, my concerns and my misgivings, and above all to be infected by the excitement of the times, and the fantastic explorations that lie ahead, that will transform forever our views of ourselves and of the universe that surrounds us, that will change the very structure of knowledge that we delve into, manipulate, and add to in the hope of creating better tomorrows...

So, let us look into the Seven Pillars of the Knowledge Revolution...

**First: Parsing, Life & Organization of Knowledge** Since the beginning of time, whether we were writing on scrolls or on codexes whether the codexes were printed or manuscripts, the accumulation of knowledge was based on parsed structures, with units put next to each other like bricks in a wall of an emerging structure.

It was the juxtaposition of these individual parsed works that created the accumulation of knowledge... the rising edifice built piece by piece, brick by brick or stone by stone...

In addition, each piece was “dead”. By that I mean that once published it stayed as it was until a second edition would appear. If we both had copies of the same book, we could both open to, say, page 157 and find exactly the same thing in our respective copies. It did not change whether we did it immediately after the book appeared or decades later.

The Internet changed all that...

The webpage became the unit of parsing. Instead of the classical sequence of presentation, we now think in terms

of a homepage and then hypertext links into other related documents. We can expect more fluidity into the merging of image, both still and video, and the transitions from one reference link into another.

Search engines complement the World Wide Web as the on-line material—unlike the traditionally published material – becomes alive. So, today if I look up a web page, and you look it up, at the same location a few hours later, it will probably have changed, since the material is constantly being updated.

Furthermore, as we move beyond the current structures of the web, towards the semantic web, where we can search for relationships and concepts and not just objects, the structure of organization and presentation of knowledge will become one large interconnected vibrant living tissue of concepts, ideas and facts that is growing exponentially and which will require new modes of thinking to interact with it. It will automatically spawn these new modes of thinking; and scholarship will be no longer be parsed like bricks in a wall, it will be more like a smooth fluid flowing river.

If one were to try to take into account as well the emergence of the social linkages phenomena that the

internet and the web have now made possible, we can visualize what some specialists such as Nova Spivack have called the “Meta-Web”, with high knowledge connectivity and high social connectivity. Does the Meta-web prefigure the connectivity of intelligence?

**Second: Image & Text** Throughout history, the primary means for the transmission of information has been text. Images were difficult to produce and to reproduce. This has changed. With the digital revolution, everybody can record images, both still and video, and computer generated graphics are becoming affordable by everybody.

Again what does that mean in terms of the presentation, the search and the retrieval function and the interaction between the researcher and the material in the future , and that brings me to the:

**Third: Humans & Machines** With the exception of pure mathematics and some aspects of philosophy, it will no longer be possible for any human to search for, find and retrieve, and then manipulate knowledge in any field, much less add to it and communicate their own contribution to others, without the intermediation of machines.

This is not good or bad. It just is.



Now, after a special chess playing program called Big Blue of IBM defeated world champion Gary Kasparov in Chess in 1997, can we indeed ask, as some visionaries are doing, whether “consciousness” and “intelligence” are emanating qualities from very complex systems?

But whatever the merits of that particular debate and its ramifications, it is clear that changes are already noticeable in the domain of libraries and the Internet. And one example of that is the new World Digital Library launched by the Library of Congress with the support of the Library of Alexandria and many others, which allows us to make videos, image text and commentaries and maps into one seamless whole and to be able to search by many different approaches such as time, geography, theme, cluster, or even by a single word and browse through the material from India, the United States, Egypt, Russia, all of them together. All countries coming together in this World Digital Library, prefiguring the future, as well as finding the best that one wants from the digitized material on offer from all the countries of the world.

**Fourth: Complexity & Chaos** The world we live in is remarkably complex. The socio-economic transactions of a globalizing world are exceedingly intricate as, with the

click of a mouse and the flight of an electron, billions of dollars move around the planet at the speed of light. The web of interconnected transactions is enormous, and the ripple effects of any single set of actions and its interaction with other effects is difficult to predict.

Our cities have become not only much larger but also much more complex, and ecosystems are not only delicate, they are intrinsically very complex. So are biological systems.

We will need a new mathematics.

**Fifth: Computation & Research** Till now, Computing has been largely seen as the extension of a large calculating machine that can do dumb calculations at incredible speeds.

Wonderful tools, no doubt, but just tools all the same. But today, the concepts and the techniques of computing will become a central part of the new research paradigm. Computational Science Concepts, tools and theorems will weave into the very fabric of science and scientific practice.

But beyond the scale and magnitude of the collections of data, we are looking for connections between collections of data. These pose particular problems that involve qualitatively different issues. Computer science is where the most work on such classes of problems has been done.

**Sixth: Convergence & Transformation** Domains are gradually converging. In simplest terms, once upon a time we had chemistry and biology as distinct and separate enterprises, now we have biochemistry. Such moments of convergence, generating new sciences and insights, turn out to be some of the most fecund moments in the evolution of our knowledge and the development of our technologies. Today we are witnessing the convergence of three hitherto-separate fields with the birth of BINT: Bio / Info / Nano Technology.

Will such developments remain serendipitous or will our research paradigms systematically force the development of such converging domains and transformative insights? I believe we are poised to do the latter.

**Seventh: Pluri-disciplinarity & Policy** There is a real value in crossing disciplines. Well-grounded in one discipline, we should be open to others. Increasingly, both in academic organization and in tackling real-life problems, we note that the old “silos” of disciplines by themselves are not productive enough. Much of the most interesting work is being done in between the disciplines, where they intersect or where the gaps are.

Increasingly, we recognize that our real life problems, such as poverty, gender or the environment, are all multi-dimensional and complex, and require a special way of organizing all the various disciplinary inputs. So just as we say that diversity is enriching, so is the sharing of knowledge across disciplines.

The seven pillars sketch out the contours of a revolution that will undergird that new Global Knowledge Society we seek to build. Will that new world allow us to go to better and wiser lives for all? Remember that data when organized becomes information, which when explained becomes knowledge. But to confront the challenges of the 21<sup>st</sup> Century, we will need more than knowledge. We will need wisdom. Wisdom is more than knowledge: it implies understanding and judgment, combining the insights of knowledge with the patina of experience.

Maybe that new global reality will take us there. But humility would have us ask, as T.S. Eliot did a century ago:

*Where is the life we have lost in living?*

*Where is the wisdom we have lost in knowledge?*

*Where is the knowledge we have lost in information?*

But wise or not, humanity is hurtling towards that future at great speed, and undoubtedly, the implications of these seven pillars of the knowledge revolution pose challenges to the institutions of knowledge in our societies: Our educational and research facilities, as well as the institutions supporting our knowledge: Libraries, archives and museums. Let us now turn to my second theme and look into the case of the New Library of Alexandria and how it tried to rise to that challenge...

## **THE REBIRTH OF THE BIBLIOTHECA ALEXANDRINA**

2300 years ago, Alexander the Great selected the site for his new capital: Alexandria. It was built by the Ptolemies. Its Lighthouse dazzled the world, and the Ancient Library of Alexandria, nurtured the greatest adventure of the human intellect. Part academy, part research center, and part library, it welcomed the great thinkers of the age. Scientists, mathematicians and poets from all civilizations came to study and exchange ideas. Universal knowledge was organized, unbounded inquiry was encouraged and intercultural dialogue was nurtured.

The Library completely disappeared over sixteen hundred years ago... but it continued to inspire scientists and scholars everywhere. A few years ago, the fabled Bibliotheca Alexandrina, was reborn: the New Library of Alexandria...

Like its illustrious predecessor, it is dedicated to advancing universal knowledge, not a single specialty. It is addressing research and applying advanced techniques to everything from the visual arts to informatics, from the documentation of heritage to the promotion of peace. It is a university without walls or registration, without formal certificates or structured courses.

It is open to all those who seek knowledge in all its aspects and manifestations.

All those who love art in all its wondrous expressions.

All those who thirst after a better understanding of their heritage and of the world.

All those who dream of pushing the frontiers of scientific knowledge to wherever human ingenuity will take it.

The reborn Bibliotheca Alexandrina in the era of the digital world , what is it ?

First, like its ancient name sake, it is not a library in the sense of repository of books, it is many things, it is a landmark building, it is a hive of activities, it has multiple institutions within it, it has many libraries, many museums and galleries and research institutes, all in one big complex, that we call the Bibliotheca Alexandrina or the New Library of Alexandria.

It is a spectacular building...

It has won many awards and still takes your breath away from the beauty of the building and the design , it is a large building like a solar disc slightly rising to face the sea with a small satellite which is the planetarium and an old conference centre attached to it and the whole complex is connected underground and right next to it is the campus of the university of Alexandria .

The Main Reading Area is one of the most beautiful places in the world. Truly spectacular, dramatic architecture. Our conference centre boasts the highest facilities. But it is not the building that counts, it is the hive of activities inside.

We received 1.4 million visitors and we expect to receive more in the future; we try to cater specifically to children.

We had over 600 000 reader visits last year; our websites receive over 600 million hits per year, most of whom come from Egypt, followed by the United States, followed by many other countries.

We hold many events both inside and outside the building and we held over 730 this last year, and that is including concerts, ballets, the annual book fair, and other events, but not counting the educational course meetings and the art school meetings.

The Library has multiple institutions dedicated to learning, rationality, communication and dialogue.

We are committed to the arts and to the sciences, and to how libraries are becoming digital.

The Main Reading Area is truly a hybrid library where computers and digital data support non-digital data. It also now includes a Map Library.

We have specialized libraries such as the Taha Hussein Library for the visually impaired; Children's Library for the 5 to 11 years old; Young People's Library from 11 to 16 years old; Multimedia/Audio-Visual Library; Rare Books Library; and a Microforms Library. We are proud to have



a copy of the Internet Archive as a backup for the San Francisco original.

Among the museums and galleries that we host and possess, we have 4 museums and 15 permanent exhibits. The Sadat Museum to honor the late President Sadat; Nobel peace prize winner and martyr of peace; the Manuscript Museum; the Antiquities Museum that covers examples from all the history of Egypt with donations from the various museums in Egypt; and the Science Museum combined with the Planetarium and Exploratorium that tells young people how much their Muslim and Arab forbearers, as well as the Ancient Library of Alexandria and the Ancient Egyptians, have contributed to the development of science.

Fifty centuries of science stand behind our young Egyptians who now try to make their own contributions. We show them spectacular films in the Planetarium and at the Alexploratorium they get the chance to experience hands-on science to learn that the journey of discovery is what we really call science.

We encourage them to ask “what if?”, and to experiment. We hold an annual science festival and what makes me

really happy is the fun that the kids are having in that festival which draws over 20 000 visitors every year.

The permanent exhibitions are there in many different fields, providing beautiful artworks throughout the buildings in many different places and as we go from one hall to the other we are awed by the contributions of these great artists.

We have four galleries that are used for temporary exhibitions, so we are constantly renewing our exposure to art from outside, to science exhibits, to other exhibitions as well as giving chances for young and unknown artist to emerge.

We have research institutes, starting with one that deals with manuscripts; one that deals with calligraphy and writing; one that deals with special studies; one with documentation of heritage (which produced the patented system of presenting Egyptian heritage on multiple screens and computers). That center is located in Cairo. We have the International School of Information Science, which is based on our very high-level computer work on managing library information systems and other work of that kind.

We have an Art Center that among other things created the first classical Orchestra in Alexandria, and we have the

Center for the Study of Alexandria in the Mediterranean and a Center for Hellenistic Studies that covers the period of the Ancient Library.

We have created a Dialogue Forum to discuss the problems with our society; and what we need to do get things moving in the best possible way. This has enabled us over the last ten years to mobilize Egypt's intellectuals, to produce publications but above all to engage with others.

We have enormous Digital resources. We have created archives for President Nasser, for President Sadat; for Boutros Boutros Ghaly; the Suez Canal Company; two and a half million documents. We have digitized over a hundred and eighty thousand books in Arabic, we have created special sites such as the Memory of Modern Egypt which is a kind of a world digital library in one language. There is enormous analytical work which is being presented at the Library in various conferences held at the Library.

From bio-robotics to virtual reality to super computer. The digital future is indeed here and well at the Library of Alexandria, where we are committed to provide access to all information for all people at all times. It is a goal that we intend to pursue. It is a goal that is compatible with this meeting. We are part of this formation of global knowledge

that expands our brains and enables us to do that we could not do before. We can even imagine a day when we use the new knowledge revolution and recognize knowledge not in the old librarian classifications, but in ways that reflect the reality of how knowledge is used, as these maps of interconnectedness show or as this mapping by Eigen factor of how the social sciences are interconnected or undertake self reference or how the natural sciences do it, and we can also imagine augmented reality and instant delivery of information where it is needed and when it is needed.

But the BA is also an activist organization, we handle outreach to universities and to school children (where we sent this book mobile). We organize the art programs, science fairs and science clubs in all the schools in Alexandria.

We also organize science competitions throughout Egypt for people to bring out the best in their talent and their creativity.

We offer programs to support young inventors and we need to provide even more knowledge to the public at large, and that is why we have our own TV Studio from which I am speaking at this moment and we are organizing a local TV science series in both Arabic and English, that deals with all facets of science for the public.

But perhaps the BA's most important influence in our society has been to defend values, by defending a vibrant civil society to provide credible and recognized figures that drafted together at the Library an important document in 2004, that was called 'The Alexandria Declaration' and moved us a great step forward. Throughout these years we have used the podium to uphold human rights and freedom of expression. We are proud to be associated with our Norwegian friends in what is known as "The Beacon for Freedom of Expression" program and to organize the Arab Reform conferences from 2004 all the way up to the revolution. We organize every year and get together to call for the values of freedom of expression and democracy and we had many, many young people participate in that, from plenary debates to audience participation to internet participation on international forum that we had to create. All the parts that I described of this new type of institution are essential, they reinforce each other.

So, these are our efforts to recapture the spirit of the Ancient Library of Alexandria...we are barely starting, we are not yet ten years old, and we are rocked by revolution and threatened by political currents of every stripe... But we are determined to succeed in our quest: to honor the past, celebrate the present and invent the future.

## THE LIBRARY AND THE REVOLUTION

Let me now turn to my third theme: The Revolution in my country Egypt...

Revolutions unleash the best and the worst in the human spirit. And ours started with an exalting moment...It was at the outset of the "Arab Spring"...And ordinary citizens have toppled autocrats and still battle dictators armed with little more than their convictions. Ultimately, they cannot be denied. For as Victor Hugo has said: "No army can defeat an idea whose time has come". And freedom, human rights and democracy are ideas whose time has come for even the most remote corners of the globe.

Sparked by the successes of Tunisia and Egypt, the people speak. From the Syrian demonstrators to the chanting Yemeni crowds in Sanaa,... they are the embodiment of the unconquerable spirit described by Henley's *Invictus* :

*It matters not how straight the gate,  
How charged with punishments the scroll,  
I am the master of my fate,  
I am the captain of my soul.*

This surge for freedom, reminiscent of the best in human history, will face setbacks to be sure. But ultimately, it must triumph.

The Arab Spring and the Egyptian revolution are well known. Everywhere huge demonstration held the public places in peaceful protest against the regime.

Tahrir Square in Cairo became famous as the centre of the vigils that in 18 days would topple Mubarak. The ultimate success of the peaceful Egyptian demonstrations were noticed the world over. Everywhere in Egypt the demonstrations were huge, on the Cornish of Alexandria west of the Library, as well as east of the building.

In a magic exalting moment young people held hands even as they held up signs against Mubarak and his regime, they held hands to protect the library from any damage, they saw the Library for what it was, they had no weapons except their beliefs, they held rolls of paper and the crowds responded not a stone was thrown at the Library, and as I was to tell Nic Robertson of CNN during that time who interviewed me and who was impressed by that event.

They prayed in ordinary fashion in front of the Library even as they destroyed the government building less than ten blocks away for being a hated symbol of the old regime.

They then created a huge flag in which they draped the Library in recognition that it was a library for Egypt and for the world. That exalting moment which showed up with people protecting both sides of the Library, in fact was captured in a beautiful little book for children. It was a truly exalting moment.

Then the steps of the Library became a favorite place for human rights demonstrations. Those who are worried about religious extremism, those who wanted freedom and human rights all came there and so eight years of hard work showed a clear contrast between how the young revolutionaries responded to the Library and responded to the government house a few blocks away. They even paid us a great homage by showing on a mural that they painted the three great pyramids and the fourth pyramid being the Library of Alexandria with both a mosque and a church coming out of the Library. The young people of the 25<sup>th</sup> of January dedicated that mural to those who died in the revolution.

But this exalting moment was not to last. Throughout Egypt changes were taking place in the character of the revolution, demonstrations were more likely to be about demands for employment and pay increases than demands



for freedom and democracy, gangs of thugs appeared in the streets and some of the peaceful protests would turn into violent confrontations with authority.

The Library was not immune from these changes, the goodwill among the staff that was eager to return to open the Library turned into protest that closed the Library. Many forces were at work here, contractual demands of some employees turned into a massive demonstration that turned into a full scale confrontation with authority leading to manhandling me last October.

The anger reached the level of attacks on the executive floor and physical threats to myself and my staff. But remaining true to the values of the BA and with a strong commitment to non-violence, we confronted anger and distrust with rationality and civil discourse, and in a few weeks where the Library was closed, the Library is now open and receiving and serving the public. Where the staff was demonstrating, they are back at work. And we avoided any violence, no police or army interventions, no wounded demonstrators, and not a stone thrown at the Library.

I am proud of our young staff for their commitment to the Library and its mission. But that is not the same throughout Egypt. Sporadic violence erupted, the dead

and the wounded increased, attacks on public buildings escalated including the Institut d’Egypte which was burned to the ground. The Institut which was founded in 1798 lost much of its collection of books and manuscripts, destroyed beyond repair.

Other public buildings were targeted, but today thanks to the success of our quiet non-violent discussions, our staff are protecting the Library along with its idealistic young users and the Library remains true to its mission to be a beacon of freedom, rationality, pluralism and dialogue. All matters that were never more needed in Egypt than now. It is emblematic that the statue of Prometheus who suffered for bringing fire to humanity should be standing proudly in the plaza of the Library symbolizing how the Library remains committed to its mission.

But the building of the new Egypt is also underway, we had wonderful elections and our new parliament was just seated in late January. It is true big blocks are religious-based parties, so it’s no surprise to see that the Library has been working with Sheikh al-Azhar, the highest religious authority in Egypt to bring forward the great liberal and humanist Islamic tradition which allowed science to flourish throughout the middle ages when Europe was in

the grip of darkness and ignorance. Together, we addressed large audience of religious scholars and helped issue the al-Azhar Declaration, and are in the process of reissuing the classics of that great humanist tradition.

We all need to work together and support our elected parliament. Egypt needs to build its future, a new constitution, new laws, new ways of doing things.

We need the wisdom to learn how to reinvent that past humane tradition to meet the needs of twenty-first century, we need to learn how to fashion the wise constraints that make people free.

## CONCLUSIONS

Last year, at the National Academy of Sciences, I addressed the topic of Science, Values and Revolution. Let me return to it once more...

Today, there are those who fear that the Arab Spring will give way to the Islamist winter. That the idealism of the revolutionary democrats will only pave the way for theological autocrats. Yes, Islamist sentiment is rising and zealotry is expanding in parts of the public realm. But the defense against extremism is not by censorship or

autocracy; it is by embracing pluralism and defeating ideas with ideas.

Here Science has much to say.

Science has much to say to the Islamic zealots who preach an intolerant doctrine.

It has much to say to young democrats enamored of the new technologies.

It has much to say to those who yearn for a better economic future.

And more importantly, it has much to say about the kind of values that we must adopt if our societies are to be truly open and democratic, for these are the values of science.

To the Islamists, who yearn to return to their particular vision of the Muslim past, we say, there is a great Muslim and Arab tradition of science and tolerance that you must be aware of. Indeed, throughout the dark ages it was the Muslims who held up the torch of rationality and reason, while Europe was in the throes of bigotry and intolerance.

Centuries before Bacon, Descartes and Galileo, Ibn Al-Haytham in the 10<sup>th</sup> Century laid down the rules of the

empirical approach, describing how the scientific method should operate through observation, measurement, experiment and conclusion. We hear his voice as he says:

*“We start by observing reality ... We then proceed by increasing our research and measurement, subjecting premises to criticism, and being cautious in drawing conclusions... In all we do, our purpose should be ... the search for truth, not the support of opinions”.*

Likewise, listen to the voice of Ibn Al-Nafis in the 13<sup>th</sup> Century on accepting the contrarian view, subject only to the test of evidence and rational analysis.

*“When hearing something unusual, do not preemptively reject it, for that would be folly. Indeed, horrible things may be true, and familiar and praised things may prove to be lies.”*

This is the Muslim tradition that must be revived if the Arab World, Muslim and non-Muslim alike, will indeed join the ranks of the advanced societies of our time. Rejecting politicized religiosity, and reviving these traditions would promote the values of science in our societies.

To the youth, enamored with new technologies or simply seeking a better economic future, we say: remember science and the scientific method, for it is scientific insight and knowledge that gives birth to technology. We must be the producers of knowledge not just the consumers of technology. That will not happen unless we open our minds to science and the scientific approach and open our hearts to the values of science.

What are these values of science that I keep returning to as the basis for enhancing human capabilities and ensuring the public welfare?

As Bronowski observed more than half a century ago, the enterprise of science requires the adoption of certain values: Truth, honor, teamwork, constructive subversiveness, engagement with the other, freedom, imagination, and a method for the arbitration of disputes. The values of science are adhered to by its practitioners with a rigor that shames other professions.

Truth: Any scientist who manufactures his data is ostracized forever from the scientific community. She or he may err in interpreting the data, but no one can accept fabrication of data. In no other field of human activity is this commitment to truth so absolute.

Honor. Scientists reject plagiarism. To give each his or her due, is essential, a sentiment well-captured in Newton's statement that ... "if I have seen farther than most, it is because I have stood on the shoulders of giants".

Teamwork has become essential in most fields of science. The essence of teamwork is to ensure that all the members of the team receive the recognition that they deserve.

Science advances by overthrowing the existing paradigm, or at least significantly expanding or modifying it. Thus there is a certain constructive subversiveness built into the scientific enterprise, as a new generation of scientists makes its own contribution. And so it must be. Without that, there would be no scientific advancement. But our respect and admiration for Newton is not diminished by the contributions of Einstein. We can, and do, admire both. And this constant renewal and advancement of our scientific understanding is a feature of the scientific enterprise. It requires tolerant engagement with the contrarian view, as Ibn al-Nafis said so many centuries ago, accepting to arbitrate disputes by the rules of evidence and rationality.

Science requires freedom: Freedom to enquire, to challenge, to think, to imagine the unimagined. It cannot function within the arbitrary limits of convention, nor can it flourish if it is forced to shy away from challenging the accepted.

The content of the scientific work is what is discussed, not the person who produced it, regardless of their nationality or the color of their skin or the god they choose to worship or the ethnic group they were born into or their gender.

These are societal values worth defending, not just to promote the pursuit of science, but to have a better and more humane society. These are the central core of universal values that any truly modern society must possess.

## ENVOI

Ladies and gentlemen,

Friends,

I was unable to join you today because I stayed in Egypt to do battle for those values of Science, to protect our Bibliotheca Alexandrina and to defend our societies against the forces of obscurantism, fanaticism and



xenophobia. My youthful colleagues and I, committed to the values of science, and armed with revolutionary ardor, join hands with you: the builders of the global knowledge society of tomorrow. Let us build that world of science and understanding, that world, where in the immortal words of Tagore:

*Where the mind is without fear and the head is held  
high;  
Where knowledge is free;  
Where the world has not been broken into fragments  
by narrow domestic walls;  
Where words come from the depth of truth;  
Where tireless striving stretches its arms towards  
perfection;  
Where the clear stream of reason has not lost its way  
into the desert sand of dead habit;  
Where the mind is led by thee into ever-widening  
thought and action ---  
Into that heaven of freedom, my father, let my country  
awake.*

Thank you.



ISMAIL SERAGELDIN, Director, Library of Alexandria, also chairs the Boards of Directors for each of the BA's affiliated research institutes and museums. He serves as Chair and Member of a number of advisory committees for academic, research, scientific and international institutions. He has held many international positions including as Vice President of the World Bank (1993–2000).

Dr. Serageldin has received many awards including: First recipient of Grameen Foundation (USA) Award for a lifetime commitment to combating poverty, (1999); Officer of the Order of Arts and Letters awarded by the government of France (2003); Pablo Neruda Medal of Honor, awarded by the Government of Chile (2004); The Bajaj Award for promoting Gandhian values outside India (2006); Order of the Rising Sun – Gold and Silver Star awarded by the Emperor of Japan (2008); Champion of Youth Award by the World Youth Congress, Quebec (2008); Knight of the French Legion of Honor awarded

by the President of France (2008); The Swaminathan Award for Environmental Protection (Chennai, India, 2010); Millennium Excellence Award for Lifetime Africa Achievement Prize, by the Excellence Awards Foundation, Ghana (2010); The Public Welfare Medal, by the National Academy of Sciences, Washington DC (2011); Commander of the Order of Arts & Letters awarded by the government of France (2011).

He has lectured widely all over the world including delivering the Mandela Lecture (Johannesberg, 2011), the Nexus Lecture (Netherlands, 2011), the Keynote Address to the First International Summit of the Book (Washington DC, 2012). He was distinguished professor at Wageningen University and at the College de France.

He has published over 60 books and monographs and over 200 papers on a variety of topics including biotechnology, rural development, sustainability, and the value of science to society. He holds a Bachelor of Science degree in engineering from Cairo University and Master's degree and a PhD from Harvard University and has received over 30 honorary doctorates.