



## The Role of Academies\*

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### Abstract

*Brief history of academies is presented, and the current role of academies is outlined.*

### 1. Introduction

**Contemporary world is global, interdependent and rapidly changing.**<sup>1</sup> These features are occurring for the first time in human history. All of these features are science and technology generated. Present time can be best described by Charles Dickens' opening sentence of his novel "The Tale of Two Cities" describing the times encompassing the French Revolution: "It was the best of times, it was the worst of times, it was the age of wisdom and it was the age of foolishness, .... it was the spring of hope, it was the winter of despair..." The world is currently facing economic, political and moral crises. The only inexhaustible resource is knowledge. The most valuable capital is human (including social) capital, as shown by Sir Partha Dasgupta and his collaborators (see Table 1). The second column lists the real total capital of each nation and HC indicates the percentage due to human capital. Human capital includes health, education, freedom, creativity and activity of human beings, and once again science and curiosity-driven research play essential roles.

**Table 1: Real Wealth of Nations<sup>2</sup>**

USA (2008)	=	\$ 117.8 trillion	(HC = 75%)
UK	=	\$ 13.4	(HC = 88%)
Saudi Arabia	=	\$ 4.9	(HC = 35%)
Brazil	=	\$ 7.4	(HC = 62%)
Russian Federation	=	\$ 10.3	(HC = 21%)

"All men by nature desire to know" wrote Aristotle in his *Metaphysics*. The curiosity-driven research is one of the essential human characteristics and needs. Notwithstanding enormous progress in all scientific disciplines, our knowledge is still quite rudimentary. Whenever we hope we have attained the Standard model we realize that it accounts for possibly just less than 5% of one particular universe (as we know in physics). Facing the complex world we live in, opportunities, threats, dangers, weaknesses and strength as well as overcoming crises – each one and all of them demand research and understanding!

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Schools, universities, research centers and academies are components of an intertwined system generating and maintaining research and understanding. Here we will concentrate on one: academies. Academy is an institution of higher learning, research and honorary membership.

## 2. Brief History

The archaic name of an area containing a sacred grove of olives outside of Athens' wall dedicated to goddess Athena was *Εκαδημια*. The name later evolved into *Ακαδημια* (and became linked with the name of an Athenian hero *Akademios*). This was a sacred place from the Bronze Age (cult possibly associated with hero-gods *Castor* and *Polydeuces*, and with *Akademios*, *Theseus* and *Helen*). When he was 30 years old *Plato* (424-348 BC) acquired this grove and lectured there (estimated to be mid 380 BC). The *Plato's Academic Club* was exclusive, but – at least during *Plato's* time – there was no charge. Two women were part of the Academy: *Axiothea* and *Lasthenia*. According to a legend originated 700 years later the phrase “Let none except geometers enter here!” was inscribed above the entrance of the Academy. A famous member of *Plato's* Academy was *Aristotle* who later founded his *Lyceum*. Though it is often said that *Plato's* Academy was a school for future politicians, the evidence is not convincing. The last head of the *Plato's* Academy was *Philo of Larissa* (154-83 BC). In 86 BC *Lucius Cornelius Sulla* conquered Athens and destroyed *Plato's* Academy and *Aristotle's* *Lyceum*. The destruction was so complete that the new academy had to be opened in a different place. After a lapse of an early Roman occupation, the Academy was re-founded including many international scholars. The last head of the Academy was *Damascius of Syria*. Emperor *Justinian* closed the Academy in 529 AD. Some members of the Academy went to *Harrar* near *Edessa* and it seems that the part of the Academy survived to reemerge during the Islamic Golden Age as the *House of Wisdom* and the *Academy of Gundishapur* (6<sup>th</sup> to 12<sup>th</sup> AD) in *Sassanid Persia*. In parallel with *Plato's* Academy numerous research centers developed from 6<sup>th</sup> century BC till about 12<sup>th</sup> century AD, e.g.: *Taksasila* (near *Islamabad*, *Pakistan*), *Nalanda* (*Bihar*, *India*), *Varanasi* (*India*), *Kanchipuram* (near *Chennai*, *India*), *Guozijian* (located in the capitals of *China* during *Han*, *Sui* and *Ming* dynasties). Famous scholars and scientists mark these activities: *Panini* (4<sup>th</sup> century BC *India*, known for his *Sanskrit* grammar), *Atreya* (great *Hindu* sage and physician, 6<sup>th</sup> century BC) and *Kautilya* (*Chanakya* – 370-283 BC, author of *Arthashastra* considered to forebode *Il Principe*).

While the oldest universities in Europe were founded from the 11<sup>th</sup> century (*Bologna* 1088, *Oxford* 1096-1167, *Salamanca* 1134, *Paris* 1160, *Cambridge* 1209, *Padua* 1222, *Naples* 1224, and *Schola Medica Salernitana* even in 9<sup>th</sup> century), academies were established much later. *Cosimo de' Medici* founded an academy in 1439, and the *Accademia di Belle Arti* was established in *Firenze* in 1563. *Accademia della Crusca* founded in 1582 and devoted mainly to language studies inspired *Richelieu* to establish *Académie Française* in 1635. *Accademia dei Lincei* was founded in 1603 in *Rome*, and *Accademia del Cimento* by *Galileo's* students in 1657.

Origin of the *Académie Française* was in informal literary group meetings at *Hotel de Rambouillet* since early 1620. In 1635 at *Richelieu's* urging *Louis XIII* granted “to labor with all the care and diligence possible, to give the exact rules to our language, to render it capable of treating the arts and sciences.” *Académie Française* was suppressed in 1793 during the *French Revolution* and restored under *Napoleon* in 1803. In 1795 all *French academies*

were replaced by Institut de France with classes. Louis XVIII in 1816 restored the name Académie. The President of France is the “protector” of Académie Française numbering 40 immortals (total 719, 6 women, first elected Marguerite Yourcenar in 1980). 20 members have been expelled: Auger de Moléon de Granier in 1638 because of theft, Ph. Petain and three others because of Vichy). Académie Française included politicians (5 heads of France, e.g.: A. Thiers, R. Poincaré and V. Giscard d’Estaing, one foreign L.Sedar Senghor). Among the members of Académie Française were Voltaire, H. Poincaré, V. Hugo, L. Pasteur, but not J.J. Rousseau, J. P. Sartre, H. De Balzac, R. Descartes, D. Diderot, M.Proust.

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Academia Naturae Curiosorum was founded by four physicians in 1652. In 1677 Leopold, emperor of the Holy Roman Empire recognized it and in 1699 gave the name Leopoldina. On Nov 28, 1660 a group of twelve scientists from the Invisible College announced the formation of “College for the Promoting of Physico-Mathematical Experimental Learning” and in 1662 Charles II signed a Royal Charter for Royal Society, and since then every monarch is a patron of the Royal Society. In 1666 Colbert gathered a group of scientists to found a scientific society of Paris, and in 1699 Louis XIV established Académie royale des sciences. Brandenburg Academy was initiated by Leibnitz who was its first president in 1700. Russian Academy of Sciences was established in 1724 by Peter the Great, and it was initiated by Leibnitz. Swedish Academy of Sciences was founded in 1739.

Academia Scientiarum et Artium Slavorum Meridionalium (Jugoslavenska akademija znanosti i umjetnosti) was initiated by Bishop J. J. Strossmayer (his proposal in the Croatian Parliament in 1861 was unanimously approved. Emperor and King Franz Joseph approved it in 1866 originally appointing 14 members). Bulgarian academy was founded in 1869 and Serbian in 1886.

Act of Incorporation of the National Academy of Sciences (NAS) was signed by A. Lincoln on March 3, 1863 and nominated 50 charter members. First president of NAS was A. D. Bache, and second Joseph Henry. Institute of Medicine was established in 1970, National Academy of Engineering in 1964, while the National Research Council was founded in 1917.

Several observations can be made from the history of academies and research centers. First, academies, research centers and universities are closely intertwined and they represent one of the earliest and most important aspects of human civilizations. Second, spectrum of their activity is very broad – from astronomy and physics to languages, political sciences and spirituality, thereby being the essence of human development. Third, all academies are associated with sovereign states, but frequently political power destroyed academies: Sulla destroyed Plato’s Academy in 86 BC, then Justinian closed it in 529 AD, Library of Alexandria was destroyed several times (attack of Aurelian in AD 270-275 [it was during his reign that the title *dominus et deus* referring to him was used on official documents], order of Patriarch Theophilus of Alexandria in 391 AD, murder of Hypatia in 415 AD and destruction by Caliph Omar in 642 AD) and Mamluk dynasty destroyed Nalanda in 1200 AD.

Politics, science and research are strongly but strangely intertwined. It was realized already by Aristotle who refers to politics as *master science*, but considers political system

to be an organism where all parts cannot exist without others, and the best form of government is that where every man, whoever he is, can act best and be happy.<sup>3</sup> Though research and science are the main engines of current development, political structure still maintains its odd relationship with researchers and universities and academies. Apparently, French President G. Pompidou said “There are three roads to ruin: women, gambling and technicians. The most pleasant is with women, the quickest is with gambling, but the surest is with technicians.”<sup>4</sup> It is not clear what he meant by “technicians”, but it is likely he thought of scientists. Lisbon Strategy of the EU, European Council, March 23-24, 2000 aims

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to make the EU “the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion” by 2010. 3% of the national GDP devoted to R&D was a guarantor of achieving sustainable economic growth. None of these goals were achieved,<sup>5</sup> actually now the national average for research and innovation spending by all member states is 2.06%. “The applied and hard sciences are at risk. EU research funding in general is currently threatened by massive budget cuts of up to one billion euros, which Christian Ehler, Member of the European Parliament Industry, Research and Energy Committee has condemned as completely unacceptable.” In addition, President Jean-Claude Juncker has abolished both the Chief Scientific Adviser position and Bureau of European Policy Advisers.<sup>6</sup>

### 3. Global Academies

In a global world it is necessary that educational, research and political structures do have global aspects also. Pontificia Insigne Accademia di Belle Arte e Letteratura dei Virtuosi al Pantheon was founded in 1542, the title Pontifical was conferred by Pope Pius IX in 1861 and Accademia was added in 1928 by Pope Pius XI. Accademia delle Scienze has its roots in Accademia dei Lincei founded in 1603, and then Pope Pius IX reestablished it in 1847, and then Pius XI in 1936. Pontifical Academy of Science has up to 80 members. These are the first global academies. There are now 11 pontifical academies (e.g. Pontificia Accademia della Teologia founded in 1718 and of Archaeology founded in 1810, as well as Pontifical Academy of Social Science and Pontifical Academy for Life both founded in 1994, the second one devoted to promote the life ethics consistent to the Roman Catholic Church).

On the initiative of Albert Einstein, John A. Fleming (former president of ICSU), Richard Montgomery Field (former chairman of International Committee on Social Value of Science), Sir Ian Clunies Ross and Homer Le Roy Schantz and following the International conference on Science and Human Affairs organized in October 1956 in Washington scientists established the World Academy of Art and Science (WAAS) in 1960. One of its Charter fellows Hugo Boyko emphasized in his talk in Washington: “Mankind has become a whole and undividable unit... We have all become neighbors. ... We are starting to trespass the accepted border of earth, space, matter and energy... If already these decisive dividing lines of nature seem to disappear before our very eyes and in our comprehension, how small and insignificant and negligible seem the political frontiers.... We need farseeing statesmanship in cooperation with leading scientists.” WAAS had 40 founding members: 14 from the USA, 6 from France, 6 from the Netherlands, 5 UK, 3 Israel, 2 Belgium, and one from Italy, India

Canada and Denmark each. Among them were: Pierre Auger, John Boyd Orr, H. Boyko, G. Brock Chisholm, H. Lasswell, H. J. Muller, R. Oppenheimer, J. Rotblat, B. Russell, H. Urey. Among famous Fellows are: John Eccles, Buckminster Fuller, A. M. Lwoff, A. Myrdal, G. Myrdal, A. Maslow, Y. Menuhin, H. Moore, L. Pauling, P. Noel-Baker, F. Seitz, J. Salk, A. Tiselius. (Nobel Prize laureates underlined)

The Article III of the Statues of WAAS declares its objective and purposes:

- to contribute to the progress of global civilization, human welfare, evolution of global governance, peace, sustainable development and the realization of human dignity through transnational studies, projects, appraisals and recommendations; and
- to function as a transnational forum for interdisciplinary discussion of art and science and the social consequences and policy implication of knowledge.

And the motto of the WAAS is: ***Leadership in Thought that Leads to Action.***

Presently, WAAS has 730 fellows from all continents. In addition to full fellows, WAAS has associate and junior fellows. The first president of WAAS was Lord John Boyd Orr, Nobel Prize winner and President of FAO. He was followed by ecologist Hugo Boyko, and then microbiologist Stuart Mudd, President of National Academy of Sciences Detlev Bronk, Harold Lasswell, A. Schweitzer professor of law, economist Walter Isard, professor of law R. St. John McDonald, microbiologist Carl-Goran Heden, Harlan Cleveland - diplomat, educator and former US Ambassador to NATO, Walter T. Anderson, political scientist, J. H. Schwartz, archaeologist, Ivo Šlaus, physicist and Heitor Gurgulino de Souza, physicist and former director of UN University. Currently, the main focus of WAAS is developing a new paradigm of human centered development. WAAS is a member of InterAcademy Panel and it closely collaborates with many international organizations, e.g. Pugwash Movement, The Club of Rome, Club de Madrid, European Leadership Network, World Future Council, Partnership for Change as well as other national and regional academies.

The Global Young Academy (GYA) has been established in 2010 following the 2008 and 2009 Summer Davos conferences and with the support of the InterAcademy Panel (IAP). GYA focuses on science and policy, education and outreach, and the research environment. Members of GYA are those of average age of 35 years and at the beginning of their independent academic careers. Its office is at the Berlin Brandenburg Academy. As of 2014 GYA has reached its full capacity of 200 members from 58 countries elected for a period of 5 years, and it has 63 alumni.

In addition to these two truly global academies, in 1983 TWAS – The World Academy of Sciences for the advancement of science in developing countries was founded by Abdus Salam in Trieste. In 1985 the UN Secretary General gave TWAS UN support and the 2004 Italian law assures financial support to TWAS. Currently, TWAS has almost 1100 members from 90 countries.

Islamic World Academy of Science (IAS) was founded in 1986, and now has almost 100 members.

ACAL – Latin American Academy of Sciences was founded in 1982 with Pontifical Academy’s initiative, and currently has 154 members.

African Academy of Sciences (AAS) was founded in Trieste at TWAS conference in 1985. It was supported by Carnegie Corp. and Rockefeller Foundation, and now by Government of Kenya. In 2011 AAS had 162 members.

European Academy of Sciences, Arts and Humanities was founded in 1979 in Paris. Among its founders are: I. Prigogine, L. Leprince-Ringuet and R. Huygens, and its first president was Raymond Daudel.

Academia Europaea was founded in 1988 in Cambridge. There were 110 founding members from Europe: Sir Arnold Burgen (first president), H. Curien, U. Colombo, B. Flowers, R. Mössbauer, E. Seibold, R. van Lieshout and D. Magnusson. Among 110 founding members there were two from former Yugoslavia. Academia Europaea included scientists from all European countries as well as scientists from other countries, notably the USA and Israel. Today it numbers over 2000 members from 35 European and 8 non-European countries.

European Academy of Sciences and Arts was founded in 1990 in Salzburg, and its founders were F. Unger (president), P. Klaus, and E. Gornik. Currently it has over 1500 members, and presidents of several European countries act as its protectors.

Several associations of academies have been established: ALLEA – All European Academies, founded in 1994, includes 52 academies from over 40 countries. Its first president was P. Drenth (Netherlands), followed by Jüri Engelbrecht (Estonia) and now Günter Stock (Germany).

IAP – InterAcademy Panel, founded in 1993, includes 106 national academies, and now includes WAAS. It is operated by TWAS and located in Trieste. IAP co-chairs are Volker ter Meulen and Mohamed Hassan. In 2000 IAP established InterAcademy Council (IAC) governed by a board of 15 academies' presidents from around the world. InterAcademy Medical Panel (IAMP) includes academies that have medical members. IAMP is also located in Trieste and currently includes 69 academies. The mission of IAP, IAMP and IAC is to reach out to society and to participate in essential discussions. This task is accomplished by issuing statements and IAP has issued statements since its beginning in 1993. One of the recent (Nov 2014) IAP and IAMP Statement is on Antimicrobial Resistance: A call for Action.

#### 4. Academies and Politics

More than 200 years ago Friedrich Schiller wrote “Our century has given birth to a great epoch. But the great moment finds a stunted generation. And even more stunted rulers.”<sup>7</sup> This is today even more so – since the contemporary world evolves much more rapidly and it is interdependent and global. As we stressed already this great epoch is generated by science and causes politicians to be stunted. Can science help to guide citizens and guide leaders? This is a crucial issue since Plato and now again re-addressed by Y. Dror in his recent book “Avant-garde Politician – Leaders for a New Epoch”. Research is mainly done

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at universities and research institutes (in some countries research institutes are affiliated with academies), hospitals and industrial and agricultural complexes. What is the role of academies, of national, regional and of global academies? Certainly, it cannot be only to do research, since that is much better done by universities and research centers. Are missions of national academies different from those of international academies? Maybe a hint can be found in several important numbers characterizing our world and these are: 7 billion increasing rapidly to ten billion human beings, about 5,000 different cultures, about several million different species and one global world, superimposed on about 200 sovereign states and numerous international organizations and association of organizations and states, e.g. UN system. It is maintenance, resilience and strengthening of all of them and these tasks are simultaneously scientific (i.e. research and understanding) and political (facing ambiguity, uncertainty and urgency).

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## Notes

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