



RETROSPECTIVE
AND
REFLECTIONS

A PLANETARY MOMENT

February 15-19, 2021



Retrospective and Reflections on WAAS@60

GARRY JACOBS, President & CEO, WAAS

DONATO KINIGER-PASSIGLI, Vice-President, WAAS

WINSTON NAGAN, Chairman of the Board of Trustees, WAAS (2013-2019)

IVO ŠLAUS, Honorary President, WAAS; President, WAAS (2011-2013)

ALBERTO ZUCCONI, Chairman of the Board of Trustees, WAAS



Abstract

Solution to the complex nexus of problems confronting humanity exceeds the capacity of any individual or small group of individuals or organizations. But it does not lie beyond the capacity of the collective aspiration, intelligence and determination of humanity. The world needs aspirational leadership that transcends the partisanship and limitations of self-interested political, economic and cultural perspectives. It needs people and organizations committed to think on behalf of all humanity, not simply themselves. It needs leadership that brings people together rather than divides us into competitive factions and warring camps. It needs transdisciplinary thinking that spans all boundaries, in search of truths that complement and complete rather than compete and negate one another. It needs education that enlivens and inspires, awakens creativity and fosters true individuality, rather than egoism. We need individuality that identifies with and works for the common wellbeing of all. The World Academy of Art & Science is a network of committed individuals from around the world working with other like-minded individuals, organizations and networks as strands of a universal network of networks with the collective power to unleash a global movement of conscious social evolution.

Leadership in Thought

Seventy-two years after the first atomic bomb was dropped on Hiroshima, the United Nations Treaty on the Prohibition of Nuclear Weapons (UNTPNW) officially came into force on January 22, 2021 after Honduras became the 50th nation to ratify the 2017 treaty. Three days later the world commemorated the 75th anniversary of the first UN resolution, adopted by consensus on 24 January 1946, establishing the UN goal of the elimination of nuclear weapons and other weapons of mass destruction. These two events symbolize the acts of a great many individuals and organizations over the past eight decades. They have a story to tell which is directly relevant to the past, present and future of the World Academy of Art & Science and to humanity as a whole.

The origins both events can be traced back to the letter written by Albert Einstein to US President Franklin D. Roosevelt on August 2, 1939, which led to the establishment of the Manhattan Project under the leadership of Robert Oppenheimer, the atomic bombing of Japan on August 6 and August 9, 1945, the start of the Cold War, the division of Europe into rival military blocs, the invention of the H-Bomb in 1952 and onset of the nuclear arms race, which eventually led to the production of more than 110,000 nuclear arms weapons. That history includes the eminent dangers of the Cuban Missile Crisis in October 1962 when US Assistant Secretary of State and later WAAS President Harlan Cleveland conveyed messages back and forth between Dean Rusk at the UN Security Council and John F. Kennedy at the White House trying to avert nuclear war and to later efforts by Cleveland, as US Ambassador of NATO, to convince NATO member countries that nuclear war was unwinnable.

These momentous external events mark but also conceal another story of equal or greater significance that have occurred in the minds and hearts of human beings during the 75 years since we entered the Nuclear Age. They are marked by the release of the Russell-Einstein Manifesto in 1955 warning of the catastrophic dangers of nuclear war with such heart-wrenching declarations: *Renounce war or perish!, World peace or death!*, and *“We appeal as human beings to human beings: Remember your humanity, and forget the rest.”*¹

The Manifesto was followed by the first of the Pugwash Conferences in 1957 and to the establishment of the World Academy of Art & Science in 1960, with Oppenheimer and four of the eleven signatories of the Manifesto—Einstein, Russell, Joseph Rotblat, Hermann Muller—among its founders. Muller became the Academy’s first Vice President.

This second line of events in the consciousness of countless human beings also had momentous consequences. It led to the first Limited Test Ban Treaty in 1963, the Nuclear Non-Proliferation Treaty in 1968, the Strategic Arms Limitation Treaty in 1972, the International Court of Justice’s advisory opinion in 1995, the signing of UNTPNW in 2017, and to the decision of Russia and USA to extend the new Start Nuclear-Arms Control Treaty in late January 2021. It is marked by the gradual rise of the nuclear non-proliferation movement fueled by the unceasing efforts of thousands of dedicated individuals and NGOs over the past half century, as evidenced by the award of the Nobel Peace Prize to WAAS Fellow Linus Pauling (1962), the International Physicians for the Prevention of Nuclear War (IPPNW - 1985), Rotblat and Pugwash Conferences (1995), IAEA (2005), and the International Campaign to Abolish Nuclear Weapons (ICAN -2017) for their unceasing efforts to ban the bomb.

WAAS was a child of these events—founded by many of its founders—and always striving to keep alive the flame of its inspiration. WAAS President Harlan Cleveland picked up the earlier threads of



this work with a book entitled *Birth of a New World: Open Moment for International Leadership* and release of *Uncommon Opportunities: An Agenda for Peace and Equitable Development* by the International Commission on Peace and Food (ICPF) at the WAAS General Assembly (Minneapolis 1994), and again with ICPF in Delhi (2004).² It was included on the agenda of the NATO workshop on terrorism at the WAAS Zagreb GA (2005). WAAS collaborated with Global Security Institute on three events in 2006-07 and through several events of the Middle Powers Initiative, and provided a major grant for an initiative involving presidents Mikhail Gorbachev and Jimmy Carter. Then WAAS Fellow Jasjit Singh organized an official international conference of the Government of India on nuclear abolition with addresses by the Prime Minister and other top officials (Delhi, 2008).³ WAAS partnered with The European Leadership Network for a conference on nuclear threats and for a NATO meeting of ambassadors in Croatia (2012). Several seminal articles were authored on the illegality of nuclear weapons in *Cadmus*.^{4,5} And extending far beyond the direct reach of the Academy, WAAS Fellows heading other organizations including Parliamentarians for Nuclear Non-Proliferation and Disarmament, Nuclear Age Peace Foundation), and numerous leading members of Pugwash have all played very visible, significant roles in fostering progress on nuclear abolition during the past few decades.

This timeline carries within it an imperative message to be perceived rather than explained. Its essence is the irresistible and inevitable power of persistent human aspiration and values to accomplish in the past, the present and the future yet to come. The countless individuals and organizations who contributed to the evolution of global society from world war, cold war and the nuclear arms race to the UNTPNW exemplify the motto of the Academy Leadership in thought that leads to action.

“If man is to take the future evolution of body, mind and civilization in his own hands it is imperative to find more effective ways of integrating what he knows with what he does.”⁶

The Double-Edged Sword

For WAAS, the nuclear arms race was an issue of immense importance but it was not its *raison d’être*. Pugwash Conferences was established by some of the same individuals and countless other organizations were founded subsequently with the explicit mission of addressing the threat of weapons of mass destruction. WAAS was not. The founders of the Academy had a wider mission in view, of which their work on nuclear abolition was a very important part, but not its defining purpose. For they perceived that nuclear weapons were only one expression of a much greater issue of immense relevance and importance to all aspects of human existence—the role of knowledge in the evolution of global society.

The idea of founding an international association for exploring the major challenges facing humanity in a nongovernmental context grew out of many interactions that took place among leading scientists and intellectuals in the years following World War II. It assumed concrete shape at the First International Conference on Science and Human Welfare in Washington, D. C. in 1956. The main subject of the conference was the future of humankind. Its first and foremost aim was to chart a peaceful course for global social progress, toward a “future in which all mankind will be able to enjoy the immense achievements of the human brain.” Its strategy was to create a permanent transnational forum in which this objective could be pursued on a non-political, impartial, scientific and highly ethical basis.⁷

The decision they took was to establish a global Academy of Art and Science, “an institution of the highest scientific authority held in the highest esteem by all peoples as a strictly objective advisory body for countries and peoples, and gradually growing into an influential position in all questions decisive for the future of mankind.”⁸

The conference led directly to the formal establishment of WAAS on December 24, 1960 with the call “Non-Scientists and Scientists alike! Let us all help to make this forum a true Agency for Human Welfare.”⁹

While the global scope encompassed by the World Academy’s mission is shared today by many organizations, at the time of its founding it marked a moment in which history ceased to be the history of single peoples, states or groups and humanity became an indivisible whole.¹⁰

The divisions wrought by political frontiers were rapidly vanishing even as the number of nation states multiplied nearly three-fold within a few decades. The UN system was already 15 years old at the time, but it remained as it still remains today, an organization directed by the will of independent nation states, more than by the aspirations of humanity as a whole.

These were heady times of rapid change. Advances in air transportation and telecommunications had begun to increase the speed, reduce the time and multiply the number and frequency of

international contacts and relationships. The world was shrinking. Marshall McLuhan would soon coin the term “global village”. DARPA, America’s Defense Advanced Research Projects Agency, had been founded two years earlier in 1958, and soon began work on the computer networking project which eventually gave rise to the Internet.

The dilemma posed by the scientific breakthrough that created nuclear weapons was not unique. Already there was increasing awareness that scientific knowledge in general could be a double-edged sword. Also in 1956, Jacob Bronowski, a mathematician who had studied the effects of the atomic bombing of Japan, published his famed essay *Science and Human Values*.

*Science has improved our lives in many ways... On the other hand, it has also given us the capacity to ravage the environment on an unprecedented scale and obliterate our species altogether.*¹¹

In parallel with the invention of ever more powerful weapons of mass destruction, science brought succor to humanity in the form of life saving antibiotics and vaccines, such as the polio vaccine developed by WAAS Fellow Jonas Salk. Who could imagine at the time that such a sacred, life-giving gift could have such dire life-threatening consequences? Yet it soon became apparent that falling death and infant mortality rates were a principal reason for unparalleled expansion of population which resulted in widespread famine and uncountable numbers of deaths. The severe impacts of the population explosion spurred a major research project in the Academy, which led to the publication in 1965 of *The Population Crisis: Implications and Plans of Action*, edited by WAAS Fellows and including contributions by more than 20 scientists.¹²

Integration of Knowledge

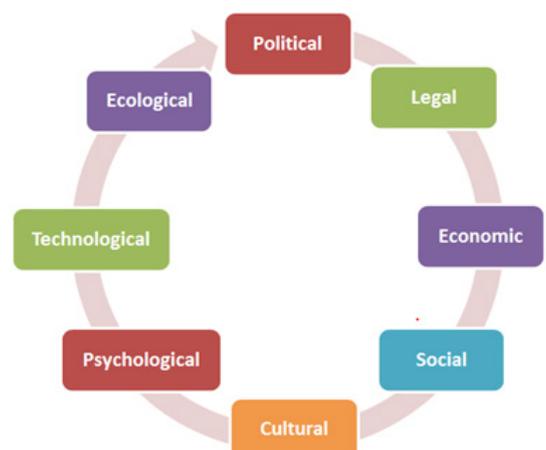
Rapid population growth could not be addressed merely by applications of science and technology in the form of antibiotics and vaccines. It also necessitated unprecedented efforts to increase the supply of food to feed the rapidly expanding populations. Massive efforts were needed to raise food production by adoption of high yielding varieties of foodgrains, another wonderful scientific breakthrough.¹³ These efforts required not merely scientific knowledge and technology to raise production, but a much wider range of expertise to rapidly introduce and disseminate it among illiterate or poorly educated populations in developing countries. It required complex integrated strategies involving creation of new institutions, changes in laws and public policy, agricultural extension and demonstration programs to persuade hundreds of millions of farmers to adopt the new technologies, alterations in education and training, rapid development and revamping of health care systems, public intervention in food procurement and pricing to prevent hoarding and speculation, improved transport and storage of surplus production to reduce waste and ensure farmers a ready market for surpluses in food deficit regions, import of hybrid seed and fertilizers, increased capacity for processing of farm produce, price supports, infrastructure investments, and coordination of scientific research within and between disciplines.

In other words, it required a very broad, multidisciplinary approach to applying science and technology to complex and very often wicked social and cultural problems that defied solution by application of new technologies based on narrow disciplinary theories, fragmented strategies, specialized institutions and piecemeal approaches.

The power of an integrated approach was powerfully illustrated in the late 1960s when India adopted a comprehensive development strategy that incorporated all the dimensions of knowledge, policy and institutional support needed for rapid growth of food production, processing, distribution and consumption. Over the next decade it enabled tens of millions of mostly uneducated farmers across the country to double India’s food grain production and transform a famine prone nation into a net food exporter, in what came to be known popularly as the Green Revolution.

Solutions to complex, wicked social problems require interdisciplinary, multidisciplinary

Figure 1: Multi- and Trans-disciplinarity





and intersectoral knowledge of the interdependences between different fields of knowledge and social activity.¹⁴ But it also requires another kind of knowledge which transcends disciplinary boundaries. It requires new ways of thinking and knowing¹⁵ that not only interlink and combine multiple perspectives and forms of knowledge but pierce beneath their surface differences to comprehend the underlying transdisciplinary social processes¹⁶ that govern them.¹⁷

By the late 1960s, the Academy had already extended the scope of its work from peace, disarmament, population and food to even more challenging and more complex problems concerning the environment. WAAS conducted a five-day joint conference with the American Geographical Society which led to the publication of *Environment and Society in Transition* in 1970.¹⁸

The topics included meteorology, population, fertility, family, food, water, energy, law, policy science, economics, waste management, health, education, electronic technology, and public order. The integration of environmental issues with these other dimensions has been a cardinal theme of the Academy's work since then, including three projects with the UN discussed later in this paper.

Two other current WAAS projects focus on monitoring the global political, social and ecological environment by publishing periodically updated editions of the [Security and Sustainability Guide](#), a global directory of major organizations working on S&S issues and another reporting latest research findings regarding all dimensions of the COVID-19 Pandemic.

As Oppenheimer wrote, "Specialization in science is an inevitable accompaniment of progress; yet it is full of dangers, and is cruelly wasteful, since so much of what is beautiful and enlightening is cut off from the world."¹⁹ He might have added that a vast amount of what is partial, incomplete and imbalanced is also cut off from the reality of the real world. The process of generalization in thinking, like the searching for patterns in big data, is largely a process of looking for correlations and commonalities, while ignoring facts that distinguish and characteristics that define individuality and uniqueness.

This is especially true in the social sciences, where the complexity of the reality being studied is infinitely greater than that of subatomic particles in a cyclotron. WAAS has been aided in understanding both the similarities and differences between the two fields by a strong contingent of physical scientists, especially Physicists, which has led to a fruitful relationship with CERN on complexity and more recently with IEEE on cognitive computing and symbiotic systems.²⁰

The difference in complexity between the natural and social sciences was the subject of a fascinating colloquium organized by WAAS and CERN in 2014.²¹ Thinkers from both disciplines concurred that the complexity of physical forces acting on inanimate physical objects pales into insignificance compared to the array of physical, biological, ecological, social, technological, intellectual, psychological, and cultural factors influencing the behavior of conscious individuals and social groups, such as the results of a national election, attractions between individuals, the popularity of a personality or performance, the outcome of a sporting event, or the fluctuations of financial markets.

The challenges posed by complex, wicked problems in the 20th century gave rise from the mid 1940s to increasing interest in a form of trans-disciplinarity known as systems theory, which was the basis for the Club of Rome's analysis of resource constraints in *Limits to Growth* (1972). The publication of this report marked the beginning of a fifty-year relationship between WAAS and the Club, including a large overlap of membership and officers, e.g., five of the last seven presidents of WAAS have also been members of the Club. Orio Giarini attended the earliest meetings of the Club and later authored five reports to the Club with pioneering insights on economy, environment, employment, education and uncertainty before being elected to WAAS, becoming the founding Editor-in-Chief of *Cadmus Journal*, a key contributor to the Academy's New Economic Theory project (NET), and eventually a member of the WAAS Board of Trustees.^{22,23}

The quest for transdisciplinary knowledge led subsequently to the exploration of more complex theories of society, such as the seminal work by the eminent social theorist Harold Lasswell, WAAS President during the 1970s, whose theory and model of complex social processes integrated political, legal, organizational, social, cultural, psychological perspectives encompassing the role of individuals, institutions, communication and most especially values.²⁴

On parallel lines this led WAAS to a study of paradigmatic change in a book of essays entitled *New Paradigms: The World 300 Years After Newton* on developments in Physics, Ecology, Economy and Art. Including among the authors was WAAS Fellow Ilya Prigogine, who was awarded the Nobel Prize in Chemistry in 1977 for his work on dissipative structures, complex systems, and irreversibility.²⁵



This thread continued in the 1990s when Harlan Cleveland organized a series of conferences on the need for an integrated theory of social development at Vancouver (1998), Washington and Chennai (1999) leading to publication of a monograph on human choice.²⁶ The work was also carried forward in a series of articles published in *Cadmus* and *Eruditio*.^{27,28} More recently, systems thinking has also been central to the work of other Fellows on the sciences of networks and complexity, as well as on the emerging discipline of anticipatory systems.^{29,30,31,32,33}

Science and Human Values

The absence of disciplinary divisions and narrowly specialized programs has been one of the defining characteristics of the work of the Academy since its inception. But it was not the only one. From its outset, the work of the Academy also distinguished itself in another way from the vast and rapidly expanding body of research focused on global challenges.

Along with the signatories of the Russell-Einstein Manifesto and other leading thinkers of the day, Bronowski realized that the relationship between humanity's role in nature and human values was not merely a question for philosophical inquiry. It had immense practical implications.

During the period in which WAAS was founded, the globalization of values was proceeding side by side with that of knowledge. The intentional lip-service paid to human rights in the UN Charter was partially compensated by the adoption of the Universal Declaration of Human Rights in 1948—a document that affirmed the highest ideas of individual freedom and equality, but fell far short of buttressing them with the force of law and mechanisms of enforcement. Subsequent decades gradually translated high ideals into political intention and social reality, until the rights affirmed in the UDHR eventually became the foundational principles and values for formation of the 17 Sustainable Development Goals (SDGs) in 2015. In *Transforming our Futures*, Ivo Slaus describes the SDGs as a conscious action plan for each one of us and for humankind as a whole and achieving them is necessary and urgent.³⁴

The latter half of the 20th century did not invent lofty human values. But it did more than any previous period in history to translate high utopian ideals into practical reality. Nearly two centuries after the Declaration of Independence and one century after the abolition of slavery in America, the US Civil Rights Movement was born in 1955 when Rosa Parks refused to move to the back of a bus in Montgomery, Alabama and a local preacher named Martin Luther King Jr. began his long march for equal rights for African Americans.³⁵

The Academy was established with the explicit aim of marrying scientific knowledge with universal human values. Apart from the distinguished signatories of the Russell-Einstein Manifesto, the founders of WAAS included not only many other accomplished scientists, among which five were Nobel Laureates at the time, but distinguished international diplomats as well: e.g. Joseph Needham, a co-founder of UNESCO; Lord Boyd Orr, the first Director General of the Food and Agriculture Organization (FAO); and G. Brock Chisholm, the first Director General of the World Health Organization (WHO). These individuals as well as others who contributed to the Academy's first volume of essays on *Science and the Future of Mankind* in 1961, all believed that science shared responsibility for the direction which humanity was taking and had an obligation to act. They realized that the ivory tower separating academia from the world around and the Cartesian divide arbitrarily separating logical thought from social reality were no longer sufficient to insulate the creators of knowledge from the consequences of its application in practice as well as in theory. They envisioned the need for a new organization that would help navigate the narrow and dangerous passages which separated the challenges and opportunities offered by emerging science and technology and help humanity evolve a more enlightened education, as discussed below, and more effective organizational structures for safe passage into a better future. WAAS was created as a transnational forum for this purpose.³⁶

The defining purpose for which the Academy was founded was not merely to transcend the limits of national perspectives. *Far more radically, it sought to transcend conventional thinking and seek out new perspectives integrating science with ethics and universal values.*

The concern for human rights, welfare and wellbeing has always been a central motivation of the Academy's work, but never so central that it does not require continuous reminders. This was the rationale for an international conference organized at the International Centre for Theoretical Physics in 2013 and for the high level symposium co-organized by WAAS, CERN and UN at Geneva in 2015 on Science, Technology, Innovation & Social Responsibility, which included leaders of five UN agencies.^{37,38}

Regardless of the topic or field of inquiry, the common thread has always been social impact on humanity—never simply on knowledge for its own sake, however valid or precious that knowledge may be. At first reading the validity of this perspective may appear so self-evident that it would

constitute the guiding principle behind all academic pursuits—and indeed it may well be in principle, though not always in practice. For the nature of knowledge is such that it is possible to pursue paths of discovery without fully considering their impact on human beings, just like the thrill of an inventor in creating a faster or more powerful machine may become so great that it takes precedence over a disinterested reflection on its usage and potential consequences. Indeed, in a world in which the quest for political power and commercial profit are such powerful motives and drivers for scientific research, it is not surprising that science leads to developments with untoward ramifications, e.g. such as the destabilizing impact on global financial markets of computerized trading technologies based on the discoveries of two former Nobel Laureates or the development of advanced fracking technologies at precisely the time when fossil fuels pose an existential threat to the future of humanity.

Reliable Knowledge

In 2008, the WAAS Board of Trustees established a Strategic Planning Committee to prepare a strategic plan for the future of the Academy.³⁹ And among the many issues the planning committee was asked to address, was the development of a program framework to characterize the type of work the Academy would undertake.

In-depth reflection on forty years of its earlier work and present occupations led to the formulation of a multidimensional conception of reliable knowledge which has guided its subsequent work over the past decade.⁴⁰ The committee’s findings were presented and endorsed by the Board in May 2009 and then adopted at the New Delhi General Assembly in November 2011.

Being a world academy composed of members drawn from the arts, social and physical

Human-centered Knowledge

The defining characteristic of this conception of reliable knowledge is based on a 1961 mission document by the founders placing emphasis on the “policy implications and social consequence of knowledge”.⁴¹

WAAS was not an academy founded for specialized knowledge in specific fields, nor for the pursuit of knowledge for knowledge sake, but rather to study the impact of knowledge on policy and society, which ultimately means with reference and relevance to human beings and their life on earth.

In other words, it must be human-centered and seek to meet all the criteria required for knowledge to be reliably relevant, applicable and effective to the lives of people.

Human-centered Economics

The importance of this shift in emphasis is best illustrated by the Academy’s work over the past decade on Human-Centered Economic Theory, which became the original impetus for the founding of *Cadmus*.

The very term human-centered Economics appears redundant, for to whom other than human beings does the subject apply—except as a metaphor sometimes applied to the economy of Nature? Yet the term conveys a profound truth that is too often forgotten by marketing analysts, investors, technology

sciences, humanities, business, public administration and civil society compelled the committee to pose fundamental questions:

- How could WAAS distinguish its mission from that of other national and regional academies?
- Is there really a common meeting point between art and science?
- Is there a unique contribution that WAAS can make to the world’s knowledge?

Rather than distinguish itself by specializing in a particular set of disciplines, issues or geographical area, the framework formulated a comprehensive approach and integrated perspective of knowledge inclusive of all disciplinary perspectives and applicable to social problems and opportunities in all fields.

Figure 2: Reliable Knowing



Figure 3: Comprehensive Approach



visionaries and public accountants trying to decipher the hidden patterns in quantitative data in a manner reminiscent of the quest of Newton to discover the mathematics describing the physical principles and natural laws governing motion and thermodynamics. The Economics of human beings is not defined by laws of Nature. The laws of economy are strictly human-made. And the principles governing their action are not limited to physical or even biological factors. They reflect complex interactions between material forces, meteorological events, political developments, technological innovations, evolving social and cultural propensities, fleeting thoughts and rumors, transient psychological sentiments and moods.

At a deeper level they are powerfully influenced by even less tangible and measurable factors such as human aspirations, as Harlan Cleveland observed in coining the phrase “revolution of rising expectations”⁴² to explain the factors responsible for the sudden rise of Asia in the 1950s. And still deeper and more ultimately, human behavior is a reflection of intangible, ethereal universal values that have persisted for millennia and yet are perpetually evolving.

For these reasons, predictions in Economics focus primarily on two ends of the spectrum—the very short term in which at least some of the most powerful determinants are assumed to remain relatively constant and longer-term macro level estimations such as those related to demography and environmental impacts. These observations are not intended as a criticism of Economic models or those applied in other social sciences. On the contrary they are intended to point to the tremendous challenges their study poses and the need for more sophisticated theories integrating and striving to understand the play of a much wider range of factors.⁴³

But the real purpose of these observations is to emphasize the obvious point that Economics is not the study of the laws of the natural world, though the physical laws certainly do constitute an important factor. Economics is essentially a human activity—a social process—created and carried out by human beings to fulfill needs and aspirations and manifest values in a shared political, legal, social, technological and cultural context. And the laws governing this activity are human-made. So in addition to the conditions imposed by objective forces of physical Nature, it is also very powerfully influenced by the subjective forces of individual and collective social existence.⁴⁴

This self-evident conclusion would not merit discussion if it were not for the fact that so much of prevailing thought, theory and policy in economics today is based on premises that subordinate human beings and their aspirations to economic objectives or value them in purely economic terms which ignore the true source of the direction, energy and power that determine and drive economic processes, and ignore or minimize the determining role of individual and collective social consciousness and the distribution of power in society.⁴⁵ Factoring in these elements leads to a perspective of economics that centers on meeting human needs and aspirations rather than complying with mythical formulations of the natural laws of economy.⁴⁶

This long comment was deemed necessary to illustrate that the work of WAAS on economic theory seeks to challenge fundamental premises on which a true science of economy and of society should be based. It seeks to emphasize the importance of maximizing human wellbeing in order to realize the human values manifested by the 17 UN Sustainable Development Goals and 169 targets of Agenda 2030, as opposed to multiplying consumption and GDP. It points to the primacy of subjective human factors as not only goals, but also the primary determinants of their achievement. It focuses on a theory that maximizes the development of human capacities for creativity and resourcefulness, which are potentially unlimited, rather than focusing primarily on the exhaustion of finite material resources.

This project led to the formation of the [New Economic Theory](#) working group consisting of more than 50 members drawn from a wide range of disciplines. These and many related themes have been the subject of international conferences in Brasilia (2014), Gainesville (2015), Lisbon (2016), Cape Town (2017), and Paris (2018) as well as seminars and workshops at Trieste, Dubrovnik and other places.

A joint paper “Quest for a New Paradigm in Economics” was published in 2017 summarizing conclusions to date. It examined important premises and principles of a transdisciplinary framework for ecologically-sustainable, human-centered development founded on knowledge of the underlying social processes that govern human accomplishment and social evolution. It presents a holistic paradigm to reunite and integrate thinking about economy with the political, legal, social, organizational, ecological and psychological dimensions of which economy has always been an inseparable part. Its central aim is the formulation of a new paradigm of economics, which will generate effective public policies and solutions to existing crises; revolutionize textbooks and teaching of the discipline of Economics around the globe; unleash societal potential for meaningful transformations to benefit the welfare and well-being of all humanity; and safeguard the planetary environment for future generations.⁴⁷ Another paper focuses on the values inherent in the concept of human capital in new economic theory.⁴⁸ These are just two of more than 60 *Cadmus* articles published on the subject over the past decade.

The Right to Employment

Building on research by WAAS Fellows under ICPF, the challenge of providing remunerative employment opportunities for all job seekers has occupied an important place in the Academy’s agenda of work since the Minneapolis General Assembly (1995), a workshop on Future of Work (1996), and conferences in Delhi (2004) and Zagreb (2005), the Academy’s first online conference (2009), and subsequent events leading up to special sessions at the UNOG-WAAS GL-21 conferences, two webinars in collaboration with Nizami Ganjavi International Centre (NGIC, 2020), and numerous articles in *Cadmus*.

The crux of this work focused on two fundamental questions which are closely interdependent:

1. Should employment be considered a fundamental human right? and
2. Is full employment an achievable goal?

In answer to the first question, the Academy concluded that the right to employment in a market economy is the economic equivalent of the right to vote in democracy. Without assured access to paid work or social welfare coverage, human beings have essentially no economic rights, which is the essential condition for true democratic political rights.⁴⁹

Future of Money and Finance

The Academy’s research on money arose out of a theoretical inquiry into the process of social development and the character of money as a social institution based on public trust. The theoretical and practical potential role of parallel currency systems was examined at a conference in Chennai (1999), continued in Zagreb (2005), and extended to examine the potential for a global currency at Hyderabad (2008).⁵³

The study of money as a social institution and the role of financial markets in economic development have been recurring themes of the NET project over the past decade, most recently at the workshop on money and finance at World Bank in Washington DC and at Dubrovnik (2019). It is based on the perspective that money is a networking device that plays a role similar to that played by language and the internet. Language enables human beings to communicate, interact, exchange information and relate in various forms in space and time. Money facilitates exchanges of goods and services between people and organizations. The Internet facilitates both of these functions at the global level with the speed of light.⁵⁴

In answer to the second question, our research concluded that granted the political will is there to support the right to employment, it is not only feasible to ensure full employment but indeed that is the most economically and socially beneficial policy that is practicable.

This is true for three reasons:

- Studies confirm that the cost of unemployment far exceeds the cost of publicly created jobs, when the true economic, social, political and personal costs of unemployment and underemployment are taken into account.⁵⁰
- Second, public job guarantee programs provide an effective counter-cyclical mechanism for stabilizing both economic performance and personal economic security offsetting the cyclical fluctuations characteristic of markets systems.
- Third, funding full employment is economically feasible and sustainable through targeted public sector programs operating at the local level to support local economies.⁵¹

*A human-centered theory and practice of economy must therefore recognize employment as a fundamental human right.*⁵²



In other words, money is not a thing in itself. It is a symbol that represents the power and willingness of human beings to relate to each other. Outside a social context, it has no value at all. Among the many published studies were papers on money, debt, people and planet⁵⁵; the evolution of wealth and human security⁵⁶; the value of monetarized and non-monetarized wealth⁵⁷; and cryptocurrencies.⁵⁸

But whatever its nature, the power of money is very real. The world has no shortage of money. By one estimate less than 20% of the \$350 trillion in global financial resources is used to meet real needs in the real economy. The problem is that the abundant power of money is not being consciously directed to meet the world's needs. In 2019 WAAS collaborated with UNCTAD and the UN Office for Partnerships in New York on a conference on Future Capital and joined an ongoing project examining the relationship between capital, consciousness and values involving several hundred participants, including many drawn from the finance industry and seeking ways to redirect investments for sustainable development.

This initiative has already led to three new publications. The first is a report on [Capital as a Force for Good](#) released at the GL-21 conference in Geneva (December 2020) which tracks the significant improvement in sustainable investment practices by 30 of the world's leading financial institutions.⁵⁹ The second is *Financing Our Future: Unveiling a Parallel Digital Currency System to Fund the SDGs and the Common Good*, a report to WAAS, which presents the findings of a multi-year WAAS project on the feasibility of utilizing central bank generated digital currencies to finance trillions of dollars in SDG related investments.^{60,61} The third is *Integral Investing: From Profit to Prosperity*, another report to WAAS, which teaches entrepreneurs how to build successful and fundable start-ups that address the UN SDGs within Planetary Boundaries, which is backed by decades of the author's research.⁶² This research is backed by [17 podcasts](#) collaborating with a wide range of financial experts on issues related to the future of finance.

Global Governance

From the outset, the founders had intended the Academy to provide counsel and assistance to the agencies of the UN system. This was made possible by the number of WAAS Fellows among the founders of UN agencies and those subsequently elected with extensive experience in international diplomacy, such as the founding heads of FAO, UNESCO and WHO, present and former heads of state and ministers, ambassadors, other senior officials in government and international organizations with which WAAS has collaborated. The list of past and present distinguished political leaders and diplomats elected to the Academy is far too long to replicate here, but its practical importance has been immense.

Over the decades its work has included many projects and meetings directly or indirectly related to global governance, including a series of workshops in USA during the period 1992-95 on Implications of Globalization, Global Surprise: Reframing Governance and Citizenship, Governance of Diversity, Cultural Identity and the Requirements of Civilization, and Global Governance in a Turbulent World. This led in turn to the focus on nuclear abolition, peace and security during the period 2005-10. And subsequently to three projects in direct collaboration with the UN, beginning with the New Paradigm Project in 2013.

The formulation of a comprehensive and integrated conception of global society has been facilitated by a comprehensive and inclusive program framework that takes into account the complex linkages and interdependence between all aspects and dimensions of human existence. The quest for integrated, transdisciplinary social theory became the basis for the Academy's project and major conference on "Opportunities and Challenges for the 21st Century: Search For New Paradigm" in collaboration with the United Nations Office at Geneva (UNOG) in 2013, followed by conferences in 2014-15 in collaboration with Montenegrin Academy of Sciences and Arts (Podgorica), National University of Kazakhstan (Almaty) Nizami Ganjavi International Center (Baku), Bohdan Hawrylyshyn Foundation (Kiev) and CERN (Geneva). More recently it formed the basis for collaboration between WAAS and Club of Rome on what the latter has termed the Emerging New Civilization Initiative.^{63,64}

The new paradigm project was an attempt to comprehend global society as a single integrated whole in which countries, disciplines and all fields of activity are treated not only as interlinked and interdependent, but actually inseparable and indivisible dimensions of an organic living whole, similar to the parts, organs and systems of the human body, which cannot function for a moment without reference and dependence on one another. The project focuses on tracing the multiple political, economic, social, cultural and ecological challenges confronting humanity to their common roots. It seeks to address the underlying fissures created by abstract theories, disciplinary boundaries, decontextualized education, institutional barriers, fragmented strategies, piecemeal



policies and uncoordinated implementation between different dimensions, fields, levels and regions. The project has resulted in publication of more than 100 papers in WAAS journals on various aspects and dimensions of the social process and ways to influence its speed and direction.^{65,66,67,68,69}

The project has led to five fundamental conclusions regarding the nature of the challenges and opportunities confronting humanity today: the issues are all interlinked and cannot be addressed independently from one another; all are global in nature and cannot be effectively addressed by individual nations or groups of nations as in the case of the COVID-19 pandemic and climate change; they are the result of the compartmentalization and lack of coordination between institutions, policies and programs; they are the result of specialized disciplinary theories and education; and they are all the result of mechanistic, reductionist modes of thinking that ignore the complex interrelationships that constitute reality in the real world. The project concluded that new approaches to all the major issues need to be addressed at all these five levels.

Today WAAS continues to pursue this aim. Building on the momentum of the new paradigm project, in late 2019 WAAS entered into a second partnership with UNOG for a project titled *Global Leadership in the 21st Century* (GL-21) which was made possible by the active contributions of three current WAAS Fellows with distinguished careers in the UN system.⁷⁰ The second project continues its focus on the study of the complex social challenges generated by the rapid evolution of world forces. But now the emphasis is on applying an integrated knowledge framework to develop catalytic strategies to fill the apparent global leadership gap and overcome the inertia and resistance preventing the global community from effectively addressing these challenges.^{71,72} This project involved the constitution of 15 working groups, two major conferences in collaboration with UNOG, and nearly twenty workshops, involving in all more than 350 experts and 70 partner organizations and including 11 collaborating UN agencies.⁷³ Recommendations emerging from the GL-21 project include creation of a model for multistakeholder, multidisciplinary, integrated research-policy-implementation institutions.

The Academy's program framework inevitably led it to a comprehensive approach to issues encompassing all 17 SDGs. Its effort to integrate these different dimensions arrived at perspectives closely paralleling those of the UN concept of Human Security which has been developed and promoted by the UN during the past quarter century. The Academy's work on an integrated approach to governance continues with the initiation of a project on Human Security. The project involves a survey of major stakeholder groups⁷⁴ on the efficacy of a human security approach in collaboration with the Human Security Unit, Inter-Parliamentary Union, Parliamentary Association of the Mediterranean, Inter-Academy Panel, CoNGO, WANGO and Youth Leadership Network.

Role of the Individual and the Collective in Social Processes

In its quest for quantitative scientific validity, in recent decades the social sciences have largely focused on phenomena that lend themselves to statistical analysis. One consequence is to minimize the role played by individuality and individual uniqueness in social processes and social evolution.

The Academy's concept of reliable knowledge leads instead to the recognition that the individual represents the conscious peak of the social collective and plays an indispensable role as the explorer, adventurer, inventor, entrepreneur, social catalyst, political leader, independent and original thinker, idealist and visionary.

Instead of reducing the individual to a mere statistic, it has led WAAS to examine the interdependent and complementary roles played by the individual and collective in a comprehensive theory of change, social development and social evolution. In looking to the future of the Academy 27 years ago, President Harlan Cleveland referred to what

he called the trilemma of "how to reconcile cultural human diversity with both individual human rights and the global opportunities that modern science and especially information technologies make possible."⁷⁵

The individual is a conscious initiator, the catalyst and pioneer of all social change. The collective responds, imitates, replicates and organizes the innovative behaviors until it becomes part of the mainstream social existence. Without freedom, the individual cannot innovate and create. Without rules and authority, the collective cannot organize new behaviors at the wider level of society. Thus the tension between freedom and authority repeats itself in the constant tension between the rights of the individual and the authority of the collective.

Future knowledge must seek the elusive formula for not only establishing a compromise or balance between these apparently opposing forces, but also reconciling and integrating them to support higher levels of social evolution.^{76,77}



Person-Centered Education

“If you were trying to create a global system of world-class higher education accessible and affordable to everyone, how would you do it?” This is the question WAAS posed at the UNOG-WAAS conference at Geneva in 2013. It was prompted by a UNESCO report projecting that demand for higher education would rise by 100 million students over 15 years, requiring an expansion of capacity by the equivalent of opening a few thousand universities the size of Harvard during that period. The conference occurred just at the time online learning was beginning to take off after the launch of Coursera, Udacity, edX and other platforms. Participants at this and subsequent conferences agreed that *whatever the optimal future model might be, it was not the present system of independent, degree-certifying, brick and mortar institutions.*^{78,79,80}

After the Geneva conference, WAAS posed the same question to experts on online learning from leading universities in USA and overseas at a conference it organized on Future of Education at the University of California, Berkeley in October 2013. The conference examined the concept of an alternative model for meeting the world’s expanding needs for higher education and endorsed the concept of a world university model.

The idea of founding a World University was not new to WAAS. The need for changes in education had been a recurring theme of discussion since the inception of the Academy.⁸¹ Indeed, the Academy’s founders had described their vision of WAAS as an “informal world university” and actually operated a prototype model of it in the 1960s and 70s through a distributed system of research centers headed by WAAS Fellows. In early 2014 WAAS revived the idea and founded the [World University Consortium](#) (WUC) in a meeting at the Library of Alexandria in partnership with nine other charter members, including the Library, [Foundation for a Culture of Peace](#) (Spain), [Green Cross International](#) and others. WUC elected as its first president, Heitor Gurgulino de Souza, Rector of UN University (1987-97) and WAAS President (2013-19).

From its inception, WUC has followed a multi-pronged strategy. The first focuses on development of new curriculum aligned to better meet the needs of the 21st century. It has involved the development of a syllabus for an integrated series of transdisciplinary Master’s level courses based on fresh perspectives and insights generated by WAAS on a range of different topics. The topics vary widely but are all founded on common principles. Between 2014 and 2019, fifteen curriculum development meetings were conducted and videotaped at the InterUniversity Centre, Dubrovnik on topics such as the future of democracy, social power, individual accomplishment, mind-thinking-creativity, future education, theory of money, human-centered economics, transdisciplinary science of society and global leadership. A detailed outline for a course on history of mind, thinking and creativity was also prepared. The next step contemplated is to develop the prototype for the first full master’s program on Global Leadership in the 21st Century, drawing on the research conducted during the GL-21 project with UNOG and to introduce it through partnerships with universities around the world.

The second WUC strategy focuses on development of a new paradigm for pedagogy for all levels of education. This has been a principal aim of the four international conferences on Future Education conducted by WAAS and WUC at Berkeley (2013), Rome (2017), Rio (2018) and Belgrade (2019). A fifth conference at Bucharest scheduled for June 2020 was postponed due to COVID-19. The new paradigm calls for a shift from subject to student, passive instruction to active learning, standardized mass to customized individualized curriculum, abstract to contextual experience-based knowledge, compartmentalized to inter-disciplinary content, mechanistic to organic conceptions, instructor-driven to peer to peer knowledge exchange, competitive to cooperative group learning, and memorization and understanding to thinking and creativity. The overall aim is a shift from transfer of mental information and skills to development of the student as a whole person.⁸² The new paradigm is already being applied by WUC, IACP and MSS in India at two leading institutions—Primrose School in Pondicherry operated by MSS and Global Institute for Integral Management Studies, a vocational business college in Kerala, India, focusing on employment, entrepreneurship and leadership.

The third strategy, closely linked to the first two, is to focus on a reorientation of content, pedagogy and delivery systems to promote employability, self-employment and entrepreneurship. The relationship between education and employability is well documented and was the subject of two reports by WAAS Fellows in the 1990s as well as of the Academy’s work on strategies to accelerate employment generation in both economically advanced and developing countries.⁸³ This was the focus of the joint webinars with GlobalMindEd and sessions at the June 2020 GL-21 UNOG-WAAS conference. The goal is to address the vast and widening mismatch between the knowledge, social skills, values and motivation being imparted by conventional education and the human resources



needed to meet social needs and adapt to rapid social evolution. New members of WUC include GIIMS and Global Education Futures, both of which are centrally concerned with this issue.

WAAS and WUC have concluded that rapid expansion of the educational system is feasible, affordable and absolutely essential to prepare youth for successful adulthood in the fast changing economic environment. But it will require major changes in content, pedagogy, certification and delivery systems. The fourth WUC strategy focuses on development of models for complementary and alternative delivery systems. The remarkable advances in technology have opened up promising alternatives at a much lower cost than the existing model, but the conservative nature of educational institutions has retarded their widespread adoption. COVID-19 radically altered the situation in 2020.⁸⁴ The suspension of physical classroom education generated pressure for a sudden rapid transition to online learning at all levels of education around the world. Recent experience confirms that online learning has an important role to play in the future. But it also highlights the broad array of difficulties encountered in moving education online.⁸⁵ A major limitation to widespread adoption at the university level arises from institutional resistance to changing the learning model and the near monopoly which brick and mortar institutions enjoy over the certification process.

COVID-19 has also spurred other innovations in higher education that will facilitate emergence of alternative delivery systems, including micro-credentials, career certificates and nanodegree programs. More importantly, it has broken the monopolistic high-cost system for knowledge certification, which has been one of the principal reasons for the slow adoption of alternative delivery systems by existing brick and mortar institutions. The separation of knowledge delivery from credentialing will make it possible for many different types of institutions—public, private and CSO—to expand their educational offerings, since standardized, credible credentialing will then be available from independent sources, through government, universities, businesses in different fields of competence and independent expert agencies. At the same time, it will help mobilize vast underutilized educational resources, such as the expertise of retired teachers and professionals, and make them accessible on a global basis. The increasing competition will also increase the affordability of higher education.

Why Art & Science?

Six decades later, the choice of the Academy's name may not seem as obvious as it was at the time of its founding. For today the authoritative claims of science reign supreme in the world even as it is increasingly subject to the desperate attacks by the extreme fundamentalism of outdated orthodoxies, atavistic prejudices, ethnic bigotries, racial or gender chauvinism, and religious intolerance. Indeed, today many scientists regard their profession as under siege by reactionary forces in society at a time when opinion polls show that humanity places greater trust and confidence in science and scientists than in national governments, international organizations, business, civil society, the press or any other institution other than the medical profession.

So it may be difficult to recall how great was the trust in other social institutions at the time of the Academy's founding. Americans had not yet come to doubt the near divine right of America's mission to democratize the world. Before the onset of the Vietnam War or Watergate, they were far less prone to question the integrity or judgement of their leaders or the motives of their governments. Conventional religion enjoyed far greater allegiance than it does today. Now in many countries even the majority who consider themselves religious have lost confidence in the formal institutions claiming to represent their faith. At that time, the indiscretions of churches and their leaders were still a well-kept secret. In the West the truths of democracy and free market economies were still accepted by most people as self-evident and beyond dispute. Authoritarian communism and its milder socialist versions enjoyed far greater respect and allegiance than they do today. International organizations were more identified with the lofty ideals enshrined in their constitutions than the power politics and competitive self-interest of the nation states vying to assert the principles of universal justice without accepting UN authority over its own unlimited sovereignty.

Moreover, in the mid-20th century Art was in the midst of a renaissance spurred by the horrendous consequences of scientific warfare in two world wars. It was impelled by the quest for meaning and values in a world driven mad with violence and destruction, in which mutually assured destruction actually appeared to many as the only rational choice. And in the freedom and prosperity of the post-war world, the burgeoning Middle Class sought for enjoyment and appreciation in aesthetic pursuits of beauty and joy that had long been denied through the dark decades from which it was just emerging. This was still a time when colleges and universities still cherished the ideals of a Liberal Arts education that included a sprinkling of natural and social sciences, humanities and the fine arts. It was also a time when the social sciences were still largely regarded as branches of



humanities rather than science. Physicists turned macroeconomists were just beginning to invent the mathematical equations of Econometrics and launch the unquenchable thirst for Big Data.

Under these circumstances, the inclusion of Art in the title of the Academy can be understood and even justified, though the complete exclusion of actual artists in the list of its charter member still mystifies.⁸⁶ But these alone are not sufficient to explain why the Academy's founders listed Art before Science in the title. To understand that we need to turn to early writings by the founders and their activities for greater clarity.

The answer comes from the closing lines of an essay by Hugo Boyko, the Academy's founding Secretary General: *"Let us create the scientific basis which is necessary to enable us to live and work together peacefully! **Let us use all our imagination to make an art of living.** Non-Scientists and Scientists alike! Let us all help to make this forum a true 'Agency for Human Welfare' irradiating hope and belief, and let us work together for a brighter future, a future truly adequate to Homo sapiens."*⁸⁷

This central intention is reflected in the Academy's Mission: *"The World Academy of Art and Science is an association of committed individuals drawn from diverse cultures, nationalities, occupations and intellectual pursuits spanning the arts, humanities and sciences, conscious of the profound social consequences and policy implications of **knowledge**, and united by a common aspiration to address the urgent challenges and emerging opportunities confronting humanity today."*

WAAS' founders had great faith in science. But they also realized that science alone is not enough to ensure human welfare. The knowledge required is not limited to that which can be defined by equations and quantified in mathematical formulas. It is a knowledge that encompasses the whole "art of living". It is not merely the objective knowledge obtained by analysis of the hard facts generated by observation of the external world. It depends also and perhaps more so on the subjective knowledge derived from the highest universal values, irradiated "by hope and belief". It encompasses not just material results but social consequences and policy implications. It requires not only reason but also "imagination", for the testimony of great scientists confirms that the highest knowledge has been generated by experiences of insight and intuition that transcend the linear logic of rational mental processes.^{88,89} As Bronowski, a mathematician, saw it, "Truth in science is not different than truth in the arts. The facts of the heart, the bases of personality, are simply more difficult to communicate."⁹⁰

The inclusion of Art in the title of the Academy was not merely an attempt to broaden the range of disciplines of its members, but to foster a marriage of the objective and subjective dimensions of knowledge essential for cracking the 'genetic code' of consciousness and social evolution.⁹¹ It reflects the fact that real knowledge is not arrived at independently from universal values. It is based on the realization that all human knowledge—that of the scientist as well as that of the artist and the theologian—is a social construction of reality and its efficacy depends on the values on which it is based and which it seeks to realize by application of what is known.⁹²

In his comparison of the knowledge generated by Art and Science, Oppenheimer found only a thin thread connecting the two worlds and the inherent complementarity of the two views which so many regard as contradictions to one another. He was as conscious of the limitations of the abstract language and generalizations of science performed by people living in the ivory towers of academia, as he was of the relativity of the perspectives embodied in the value-based perceptions of the artist who lives and creates in intimate vital relationship with the world and people around him using a language intelligible to people of all nationalities and cultures. He was conscious both of the essential role played by specialization in science to obtain intimate knowledge of the specific, as well as the great disservice it plays by dividing and subdividing reality into smaller and smaller parts which become more and more separated and independent of one another in human conception, whereas they are inseparable in actual fact.

Harlan Cleveland identified the reconciliation of the two cultures of art and science as an important issue that has occupied the attention of the Academy in recent years. Leonardo da Vinci and other leaders of the Italian Renaissance seemed able to both contemplate and embody the marriage of Art and Science in their work. He noted that these two forms of knowing share two common characteristics. Art and Science are two supreme expressions of humanity's creative imagination. As Einstein said, "The greatest scientists are artists as well."⁹³ Both have universal relevance and appeal. The future of both is now threatened by power claims to exclusive and separate identity for cultural groups—at the expense of both individual worth and of universal ideals, motives and institutions. Both are vulnerable to suppression by the domination of a political creed, a religious credo, or the perceived cultural heritage of a dominant majority.⁹⁴



Inspired by da Vinci's example, WAAS Vice President Eleonora Masini hosted a UNESCO supported workshop at Vinci, Italy in 1993 to study the relationship between the two human forms of expression producing art and science. She viewed both as expressions of humanity's dialogue with nature through creative processes that seek to reconcile its symmetries and ambiguities. Imagination and creativity are an unbreakable bond holding science and art together. As Bronowski said, "There is but a single creative activity, which is displayed alike in the arts and the sciences."⁹⁵ According to Oppenheimer, "Both the man of science and the man of art live always on the edge of mystery."⁹⁶ Both utilize signs and symbols to represent and decipher existence. Both science and art are powerful agents of social change and freedom: "freedom also implies the possibility of creating oneself."^{97,98}

Reflections on Art and Science

Einstein said that art and science are branches of the same tree. Indeed there is no dichotomy between art and science: they are an integral part of the same nucleon; they are complementary like yin and yang in ancient Chinese philosophy. Einstein also said that imagination is much more relevant than knowledge as knowledge has a very precise contour and dimension while imagination and creativity are boundless and surround everything else. Art is the ability to create, which implies inspiration and learning. It is made of intuition and capacity to transform material resources at hand. Art creates artifacts; through art we forge means for survival and we make tools for everyday life like Vulcan (the Greek Hephaestus), Roman god of fire and blacksmith, supreme manufacturer of art, jewels and armors.

Artifacts, arms and beautiful ornaments are all expressions of a highly specialized form of knowledge aimed at the benefit of humankind. Creativity without science would not produce any fruits and cannot elevate human values and consciousness. Art is abstract knowledge capable of transforming itself into concrete applications through a systemic, scientific approach.

Let us be clear: This is not the sphere of "fine arts" of contemporary understanding; the etymology of the word, from Latin *ars* indicates the ability to create, to act, and implies preparation and learning. Art is the mastery of celestial navigation, and some forms of traditional art extend to sports: boxing, for example, is a noble art since

antiquity. A well celebrated 2000 years old Roman statue represents a boxer with his gloves sitting on a bench after a match, while controlling his breath, recovering, and contemplating how his own art impressed the public in the arena. That is an expression of the mind, which requires scientific preparation like forensics, art of poetry, art of living, statesmanship.

Craftsmanship, boxing and declamatory (rhetoric) skills have science in common. Science being the accumulation of knowledge, and art being the expression of science that begins with the contemplation of nature and inspiration.

Leonardo da Vinci, the most celebrated artist and scientist, in his famous Vitruvian man, represented perfect proportions of the human body, which informed all his realizations, whether paintings, cannons or helicopters. He perfectly combined art and science and squared the circle, keeping humanity at the epicenter of his endless research.

Liberal arts, from medieval tradition till date, includes humanities but also physical, biological and social sciences. Again, no dichotomy but knowledge inextricably linked.

Dante Alighieri summoned future generations thus: "Consider well the seed that gave you birth: you were not made to live like brutes but to follow virtue and knowledge."

Ars Cognoscendi could not be better explained.

Universal values are another inseparable bond between them, for both art and science find their real meaning and utility in their contribution to humanity's quest for freedom, truth, harmony, beauty, love, joy and immortality.⁹⁹ Natural science and technology are forces of immense power and consequences, yet they need to be related and interpreted by human consciousness to determine their ultimate value. The signs and symbols of art are a medium for mediating and critically illuminating their social and moral implications.

Oppenheimer observed that the self-consistency of mental harmony among scientists in arriving at mutual understanding is a complement to the emotional harmony of the artist in the shared insight and elevation in consciousness experienced by other human beings through creative inspiration.



Oppenheimer perceived the marriage of art and science as the formula for human consciousness to strive for a “perpetual, precarious impossible balance between the infinitely open and the intimate”, which humanity must strive to attain in the face of the speed and complexity of life in the 20th century.

Network of Networks

From its inception the Academy has been a transnational network of individuals bound together by shared understanding, vision, and values committed to address global social challenges related to the social consequences and policy implications of knowledge. WAAS has never been a conventional organization with a fixed headquarters, paid staff or endowments. WAAS has grown both in number, activities and reach through the decades based on an alternative organizational model.

It has never operated under the overt influence or authority of any particular nation. Founded in Geneva, its headquarters tended to move along with each transition to new leadership, and is now incorporated in California but operates in a highly decentralized manner with administrative and research facilities in India and its officers living in different countries.

Long before the concept of social networks had become commonplace in thought and usage, the Academy’s leaders had understood that the power of human networks was the greatest power they possessed to effectuate change in the world. From a small core group, WAAS expanded within a few years into an Academy of 100, and then 400 by 1990, and has since then grown in number to more than 800 individuals, a good many of them past retirement age and about 100 now classified as Emeritus Fellows. But regardless of the age, occupation and activity of its members, the true wealth of the Academy still lies in the value of its people and the power of the network it represents.

That network extends far beyond the reach of a single organization with 800+ members. For each of our members is also the center and member of countless other networks of individuals and organizations, and it is through this dense and expanding fabric of relationships that WAAS has grown and continues to grow. Over the past decade some of these relationships have evolved into a network of permanent centers and active partner organizations. In 2011 [MSS](#), a 50 year old social science and educational research institute based in Pondicherry, India, became the Academy’s first official center. It remains the central hub for our research and administrative work and in 2020 was recognized as an official Center of Excellence of WAAS. Over the last decade, the network of centers and partners grew to include the Montenegrin Academy of Sciences and Arts, which has conducted five science conferences since 2012 in collaboration with WAAS; the

Inter-University Centre (IUC, Dubrovnik), which has hosted more than 15 WAAS-WUC conferences and workshops since 2012; and the Person-Centered Approach Institute (Rome), which has been a key partner in the Academy’s educational activities from 2013 onward based on its important contributions to person-centered education. In 2017 the [Institute for Advanced Studies in Levant Culture and Civilization](#) (ISACCL) was established by an act of the Romanian Parliament as the first Center of Excellence of the World Academy. Other centers include the [International Centre for Sustainable Development of Energy, Water, and Environment Systems](#) (SDEWES, Zagreb) and, most recently, the [Serbian Association of Economists](#) (Belgrade), which has hosted and co-organized several important WAAS events since 2018 and became an active partner in the New Economic Theory project.

In addition to these permanent centers, during the same period WAAS has gradually built an expanding network of partner organizations¹⁰⁰ which actively collaborate with the Academy on important projects and events. WAAS was granted Special Consultative Status with ECOSOC in 2017 and is now actively partnering on major projects with UNOG and UNTFHS. The Academy was also granted Consultative Status by UNESCO in 2019 to promote collaboration on programming related to our other major partner, [WUC](#). Since signing an MOU with CERN (Geneva) in 2014, WAAS has partnered on two major events in collaboration with the UN and two more related to science and social responsibility. Since 2014 WAAS has maintained active collaboration with NGIC (Baku) on a series of five major international conferences, including the inaugural event of the UNOG-WAAS GL-21 Project. In 2020 alone NGIC partnered on a series of ten webinars and two project proposals linked to GL-21. WAAS was accepted as a member of the InterAcademy Partnership in 2016 and is now collaborating with IAP on two projects related to the UN. Other active partnerships include the Foundation for a Culture of Peace (Madrid) Ethical Markets Media (St. Augustine, Florida), and The Millennium Project.

An old adage in organization theory holds that structure follows strategy. That has certainly been true of WAAS from the onset. A central strategy of WAAS was to seek holistic, multidisciplinary, integrated perspectives spanning all the academic and professional



disciplines in both art and science. Therefore, unlike traditional academies, WAAS was never organized based on disciplinary specialization and has no disciplinary boundaries. Rather its work was organized based on exploration of the complex interrelated dimension of global welfare and wellbeing from a multiplicity of disciplines.

The structure of WAAS reflects strategy in another sense as well. The Academy has never endeavored to carve out a unique niche for itself in any specific field such as economy, environment or technology. Rather the founders understood that the challenges they sought to address were too vast and complex for any organization to handle on its own. Instead of defining its mission or areas of expertise in terms of specific subjects or issues, it has sought to become a catalyst and facilitator of fresh thinking and creativity as an open network relating, linking to and collaborating with other individuals, organizations and networks for the common good. WAAS is a part of a global social movement—its aim is global accomplishment rather than recognition. It draws on the creative insights of its Fellows and other thinkers around the world and shares its ideas in the hope that they will be received,

processed, developed, improved, applied and evolved further.¹⁰¹

Instead of claiming its own originality or uniqueness, it has sought to become a platform and an open **network of networks** to attract and lend itself to project the best ideas, regardless of where they originated. Indeed, in the noosphere of the information age, ideas move at the speed of light, meet, combine and recombine and continuously reemerge in new forms. Who, then, can truly trace back their thoughts or deeds to their origin? The most important measure of results is global social evolution, not individual or organizational accomplishment.

Although the Academy has a governing board, executive committee and other committees, its structure and functioning resemble to some extent what Harlan Cleveland once termed an “uncentralized organization” in which direction and initiative are set by its members based on their own inspiration under the umbrella of the parent academy. The establishment of the New Economy Working Group (2015), the Security and Sustainability Guide (2019), and Tao of Finance cryptocurrency project (2018) are illustrative.

Youth Leadership Network

WAAS’ newest partner is the Youth Leadership Network established with WAAS’ active encouragement by a small group of aspiring youth with the aim of becoming a network of networks in its own right and at the same time a conduit connecting WAAS’ network of networks of older generations and organizations with the energy, dynamism and creativity of the world’s first fully networked generation.¹⁰²

Both WAAS and YLN concur that what the world needs today is not more independent organizations but more exchange, connectivity and relationship between organizations spreading out into a vast web or fabric of increasingly close and harmonious relationships in constant motion and evolution joining together, exchanging their energies and thus multiplying their momentum to become an increasingly unified and harmonious forward movement of global society.

Conclusion

The founders of WAAS were mostly scientists who cherished facts and the rigorous methodologies of their disciplines. But more than that they were seekers of knowledge who knew the limitations as well as the marvelous powers of logic and reason and were too conscious of the relativity and social construction implicit in all forms of knowledge to claim a monopoly on the real. They did not try to defend the hard facts of science against other forms of knowing for they were too conscious that the greatest scientific knowledge was itself the product of intuitive processes that transcend logic and that the subjective perception of the idealist affirming universal values and the artist viewing the world from the subjectivity¹⁰³ of a very human perspective were as essential to a complete knowledge as were the measurable facts generated by the objective measurement. They understood, as Robert Oppenheimer put it, “If a prospect is not a prophecy, it is a view”—it is only one of many ways and viewpoints by which human consciousness seeks to grasp the unity underlying infinite diversity.¹⁰⁴ Both art and science seek for that underlying unity in Nature. Or as Coleridge put it, “unity in variety”.¹⁰⁵

WAAS today may be less qualified by the individual achievements of its members than its illustrious founders, but it is perhaps more conscious of the collective power of human aspiration and values to ultimately accomplish what no single individual or organization can ever do. Sixty years after its birth, the Academy remains much like all visionary ideas more of an aspiration than a reality, young, ambitious, hopeful—with the modesty and common sense to claim very little and the ambition to still aspire for very much—still inspired by the conviction that our reach should exceed our grasp.

Notes

1. See "The Relevance of the Russell-Einstein Manifesto," a web conference of World Academy of Art and Science & Nizami Ganjavi International Center, held on July 9, 2020, which reflected on the relevance of the Manifesto to the world today. http://worldacademy.org/conferences/relevance_russell-einstein_manifesto
2. International Commission on Peace and Food, *Uncommon opportunities: an agenda for peace and equitable development* (London; Zed Books, 1995) <https://www.icpd.org/UncommonOpp/conte.htm>
3. "Towards a Nuclear Weapons Free World" June 2008 *The World Academy of Art and Science* <http://worldacademy.org/conference-page/international-conference-nuclear-weapons-free-world>
4. Jasjit Singh, "Re-examining the 1996 ICJ Advisory Opinion: Concerning the Legality of Nuclear Weapons," *Cadmus* 1, no.5 (2012): 158-165 <http://cadmusjournal.org/article/issue-5/re-examining-1996-icj-advisory-opinion>
5. Winston Nagan, "Simulated ICJ Judgment: Revisiting the Lawfulness of the Threat or Use of Nuclear Weapons," *Cadmus* 1, no.4 (2012): 93-115 <http://cadmusjournal.org/article/issue-4/simulated-icj-judgment-revisiting-lawfulness-threat-or-use-nuclear-weapons>
6. "The World University," World Academy of Art & Science <http://worldacademy.org/content/history#university>
7. Hugo Boyko (ed.), *Science and the Future of Mankind* (Dordrecht: Springer Science+Business Media, 1961)
8. *ibid*, 14
9. *ibid*
10. *ibid*
11. Jacob Bronowski, *Science and Human Values* (New York: Julian Messner, 1956) https://sciencepolicy.colorado.edu/students/envs_5110/bronowski_1956.pdf
12. Larry K Y Ng and Stuart Mudd, *The Population Crisis: Implications and Plans of Action* (Bloomington: Indiana University Press, 1965)
13. Garry Jacobs, Ivo Slaus and Orio Giarini, "Organizing International Food Security," *Cadmus* 1, no.3 (2011) <http://cadmusjournal.org/article/issue-3/organizing-international-food-security>
14. Rodolfo Fiorini, "Transdisciplinary Education for Deep Learning, Creativity and Innovation" Rome Conference Proceedings World Academy of Art and Science March 2018 94-107 <http://worldacademy.org/files/rome2017/papers/RCP-S6-6.2.Transdisciplinary-Education-RF.pdf>
15. Garry Jacobs, "Ways of Knowing: Life Beyond Chaos," *Eruditio* 1, no.4 (2014): 9-30 <http://eruditio.worldacademy.org/issue-4/article/ways-of-knowing>
16. See "Toward a Trans-disciplinary Science of Society" September 2014 The World Academy of Art and Science https://www.worldacademy.org/courses/course-2/toward-trans-disciplinary-science-society?qt-trans-disciplinary_society_cours=2&qt-programs_menu=11
17. Garry Jacobs, Winston Nagan and Alberto Zucconi, "Unification in the Social Sciences: Search for a Science of Society" *Cadmus* 2, no.3 (2014): 1-22 <http://cadmusjournal.org/article/volume-2/issue-3-part-1/unification-social-sciences-search-science-society>
18. Boris Pregel; Harold D Lasswell; John McHale, *Environment and society in transition* (New Brunswick, N.J.: Transaction, Inc., 1977, ©1975).
19. Robert Oppenheimer, "Prospects in the Arts and Sciences" in Hugo Boyko, *Science and the Future of Mankind* (Dordrecht: Springer Science+Business Media, 1961), 37.
20. International Conference On Cognition, Technology & Society" July 2019 <http://worldacademy.org/milan-conference/july-2019>
21. Garry Jacobs, Global Social Challenges: Insights from Comparison of the Natural and Social Sciences March 13, 2014 http://www.worldacademy.org/files/CERN/Global_Social_Challenges_Comparative_study_of_the_Natural_%26_Social_Sciences_G.Jacobs.pdf
22. Garry Jacobs and Ivo Slaus, "From Limits to Growth to Limitless Growth," *Cadmus* 1, no.4 (2012): 59-76 <http://www.cadmusjournal.org/article/issue-4/limits-growth-limitless-growth>
23. Garry Jacobs and Ivo Slaus, "From Limits to Growth to Unlimited Wellbeing: A Revolutionary's Vision of Wealth and Welfare," *Cadmus* 4, no.2 (2020): 225-227 <http://www.cadmusjournal.org/article/volume-4/issue-2/limits-growth-unlimited-wellbeing-revolutionary%E2%80%99s-vision-wealth-and-welfare>
24. Harold Lasswell, *A preview of policy sciences* (New York: Elsevier, 1971)
25. Sam Nilsson, *New Paradigms: The World 300 Years After Newton* (Vienna: World Academy of Art and Science, 1990)
26. Harlan Cleveland, Garry Jacobs, Robert Macfarlane, Robert van Harten, Ashok Natarajan, *HUMAN CHOICE - The Genetic Code for Social Development* (Minneapolis: The World Academy of Art and Science, 1999)
27. Winston Nagan, "Introduction to the New Paradigm of Political Economic Theory," *Eruditio* 2, no.1 (2015): 58-63 <http://eruditio.worldacademy.org/volume-2/issue-1/article/introduction-new-paradigm-political-economic-theory>

28. Garry Jacobs, Winston Nagan and Alberto Zucconi, "Unification in the Social Sciences: Search for a Science of Society," *Cadmus* 2, no. 3 (2014): 1-22 <http://cadmusjournal.org/article/volume-2/issue-3-part-1/unification-social-sciences-search-science-society>
29. "Science of Networks" *The World Academy of Art and Science* November 8, 2012 <http://www.worldacademy.org/science-of-networks-november-2012>
30. Webinar on "The Science of Complexity: A transdisciplinary exploration of Theory and Applications" *The World Academy of Art and Science* June 2013 <http://www.worldacademy.org/program-page/science-complexity-june-2013>
31. "First International Conference on ANTICIPATION" November 2015 <http://www.worldacademy.org/conferences/anticipation-2015>
32. "Webinar on Anticipation and Complexity: Foreseeing a New Paradigm of Human Development" July 21, 2015 *The World Academy of Art and Science* <http://www.worldacademy.org/conference-page/second-webinar-anticipation-and-complexity>
33. "Anticipation, Agency and Complexity" *The World Academy of Art and Science* April 2017 <http://www.worldacademy.org/conferences/anticipation-2017>
34. Ivo Slaus, *Transforming our world: necessary, urgent, and still possible* (Newcastle upon Tyne Cambridge Scholars Publishing, 2020)
35. Winston Nagan and Garry Jacobs, "Social, Political, Constitutive Process" *The World Academy of Art and Science* 2014 http://www.worldacademy.org/files/luc_courses_2014/course2/day4/Social_Process_Power_Process_Legal_Process_W.Nagan.pdf
36. Boyko, *Science* p.3-4.
37. "Impact of Science & Technology on Society & Economy" *The World Academy of Art and Science* March 2013 <http://www.worldacademy.org/trieste-forum/march-2013>
38. Conference on Science, Technology, Innovation & Social Responsibility *The World Academy of Art and Science* November 2015 <http://worldacademy.org/conferences/cern-geneva-2015>
39. Members of the Committee included Garry Jacobs (chair), Ivo Slaus, Winston Nagan, Jasjit Singh and Ruben Nelson.
40. Garry Jacobs, Winston Nagan, Ruben Nelson and Ivo Šlaus, "Program Framework for the World Academy of Art & Science," *Cadmus* 1, no.3 (2011) <https://www.cadmusjournal.org/article/issue-3/program-framework-world-academy-art-science>
41. See http://www.worldacademy.org/files/Newsletters/The_World_University.pdf
42. Harlan Cleveland, "Reflections on the "Revolution of Rising Expectations," Address before the Colgate University Conference on American Foreign Policy, July 9, 1950, in National Archives, Washington D.C., Record Group 469, Assistant Administrator for Program. Deputy Assistant Administrator, Subject Files of Harlan Cleveland
43. Garry Jacobs, "Contours of New Economic Theory," *Cadmus* 2, no.4 (2015): 139-161 <http://cadmusjournal.org/article/volume-2/issue-4-part-3/contours-new-economic-theory>
44. Orio Giarini, Garry Jacobs and Ivo Slaus, "Economic Crisis and the Science of Economics," *Cadmus* 1, no. 4(2012) <http://cadmusjournal.org/article/issue-4/economic-crisis-and-science-economics>
45. Erich Hoedl, "Economy and Society: Strategies for a More Equal Distribution of Societal Power," *Cadmus* 3, no.3 (2017): 142-151 <http://cadmusjournal.org/article/volume-3/issue-3/economy-and-society-strategies-more-equal-distribution-societal-power>
46. See "Post Graduate Certificate course on Human-Centered Economics" February 2017 *The World Academy of Art and Science* <http://worldacademy.org/course-page/post-graduate-certificate-course-human-centered-economics>
47. Garry Jacobs, Mark Swilling, Winston Nagan, Barry Gills and Jamie Morgan, "Quest for a New Paradigm in Economics – A Synthesis of Views of the New Economics Working Group" *Cadmus* 3, no.2 (2017): 10-44 <http://cadmusjournal.org/article/volume-3/issue-2/quest-new-paradigm-economics-synthesis-views-new-economics-working-group>
48. Winston Nagan and Samantha Manasa, "The Context and Values Inherent in Human Capital as Core Principles for New Economic Theory" *Cadmus* 3, no.4 (2018): 69-88 <http://cadmusjournal.org/article/volume-3/issue-4/context-and-values-inherent-human-capital-core-principles-new-economic-theory>
49. Garry Jacobs, Ivo Slaus and Orio Giarini, "Freedom and Unity," *Cadmus* 2, no.1 (2013): v-viii <http://www.cadmusjournal.org/article/volume-2/issue-1-part-2/freedom-and-unity>
50. Garry Jacobs and Ivo Slaus, "Global Prospects for Full Employment," *Cadmus* 1, no.2 (2011): 60-89 <http://cadmusjournal.org/article/issue-2/global-prospects-full-employment>
51. Pavlina Tcherneva, *Case for a Job Guarantee* (Cambridge: Polity Press, 2020).
52. Ashok Natarajan, "Theory & Strategies for Full Employment," *Cadmus* 1, no. 1 (2010): 42-48 <http://www.cadmusjournal.org/article/issue-1/theory-strategies-full-employment>

53. See http://worldacademy.org/view/index-monographs-papers-fellows?search_api_views_fulltext=jacobs&search_api_aggregation_3=money
54. Garry Jacobs and Ivo Slaus, "The Power of Money," *Cadmus* 1, 5 (2012): 68-73 <http://cadmusjournal.org/article/issue-5/power-money>
55. Jakob von Uexkull, "Money, Debt, People and Planet," *Cadmus* 1, no.5 (2012): 62-67 <http://cadmusjournal.org/article/issue-5-part-2/money-debt-people-and-planet>
56. Orio Giarini and Garry Jacobs, "The Evolution of Wealth & Human Security: The Paradox of Value and Uncertainty" *Cadmus* (2011): 29-59 <http://cadmusjournal.org/article/issue-3/evolution-wealth-human-security-paradox-value-and-uncertainty>
57. Marta Neskovic and Nebojsa Neskovic, "On the Monetized and Non-monetized Contributions to National Wealth," *Cadmus* 3, no.4 (2018): 89-101 <http://cadmusjournal.org/article/volume-3/issue-4/monetized-and-non-monetized-contributions-national-wealth>
58. Garry Jacobs, "Cryptocurrencies & the Challenge of Global Governance," *Cadmus* 3, no.4 (2018): 109-123 <http://cadmusjournal.org/article/volume-3/issue-4/cryptocurrencies-challenge-global-governance>
59. Capital as a Force For Good <https://www.forcegood.org/foreword.php>
60. Stefan Brunnhuber, *Financing Our Future: Unveiling a Parallel Digital Currency System to Fund the SDGs and the Common Good* (London: Palgrave Macmillan, in press 2021)
61. Stefan Brunnhuber and Garry Jacobs, "Innovative Financial Engineering to Fund the SDGs: A WAAS Initiative" *Cadmus* 4, no.2 (2020): 141-148 <http://cadmusjournal.org/article/volume-4/issue-2-part-2/innovative-financial-engineering-fund-sdgs-waas-initiative>
62. Mariana Bozesan, *Integral Investing: From Profit to Prosperity* (Cham: Springer International Publishing: Imprint: Springer, 2020) <https://aqualgroup.com/book-integral-investing/>
63. See <http://worldacademy.org/courses/iuc-nov-2019/transforming-future-of-money> and <http://worldacademy.org/courses/iuc-nov-2019/transforming-future-of-money>
64. Carlos Alvarez Pereira, "Emerging New Civilization Initiative (ENCI): Emergence from Emergency" *Cadmus* 4, no. 1 (2019): 1-13 <http://cadmusjournal.org/article/volume-4/issue-1/emerging-new-civilization-initiative-enci-emergence->
65. Garry Jacobs, "Uncorking the Future: Transitions to a New Paradigm" *Cadmus* 2, no.4 (2015): 69-82 <http://cadmusjournal.org/article/volume-2/issue-4-part-2/uncorking-future-transitions-new-paradigm>
66. Rodolfo Fiorini, Carlos Alvarez Pereira, Garry Jacobs, Donato Kiniger-Passigli, Alberto Zucconi, Nebojša Nešković, Herwig Schopper, Vojislav Mitic, Hazel Henderson, Mariana Todorova, Witold Kinsner, Luigi Cocchiarella, "Global Transformative Leadership in the 21st Century: A Science, Engineering, Technology Integrated and Strategic Perspective" *Cadmus* 4, no.2 (2020): 56-87 <http://cadmusjournal.org/article/volume-4/issue-2-part-1/global-transformative-leadership-21st-century>
67. Garry Jacobs, "New Paradigm: The Necessity and the Opportunity" *Cadmus* 2, no.2 (2014): 9-23 <http://cadmusjournal.org/article/volume-2/issue-2-part-1/new-paradigm-necessity-and-opportunity>
68. Alexander Likhotal, "New Paradigm Quest" *Cadmus* 2, no.4 (2015): 43-47 <http://cadmusjournal.org/article/volume-2/issue-4-part-1/new-paradigm-quest>
69. "The New Paradigm of Social Evolution: Modern Society between Hope and Tragedy" *Cadmus* 4, no.3 184-195 <http://cadmusjournal.org/article/volume-2/issue-4-part-3/new-paradigm-social-evolution-modern-society-between-hope-and-tragedy>
70. The three are Michael Moller, Director General of UNOG at the time; David Chikvaidze, Chef de Cabinet to the DG; and Donato Kiniger-Passigli, now WAAS Vice President, who had just retired after three decades of service in the UN system.
71. Garry Jacobs, Donato Kiniger-Passigli, Hazel Henderson, Janani Ramanathan, "Catalytic Strategies for Socially Transformative Leadership: Leadership Principles, Strategies and Examples," *Cadmus* 4, no.2 (2020): 6-45 <http://cadmusjournal.org/article/volume-4/issue-2-part-1/catalytic-strategies-socially-transformative-leadership-leadership-p>
72. Garry Jacobs, Donato Kiniger-Passigli, David Chikvaidze, "Global Leadership in the 21st Century," *Cadmus* 3, no.6 (2019): 10-34 <http://cadmusjournal.org/article/volume-3/issue-6/global-leadership-21st-century>
73. Garry Jacobs, Donato Kiniger-Passigli, Ivo Šlaus, Alberto Zucconi, Stefan Brunnhuber, "Leadership for a New Paradigm: Planetary Moment and Momentum" *Cadmus* 4, no.2 (2020): 1-5 <http://cadmusjournal.org/article/volume-4/issue-2-part-1/leadership-new-paradigm-planetary-moment-and-momentum>
74. "UNTFHS-WAAS-IAP Survey" The InterAcademy Partnership 27 January, 2021 <https://www.interacademies.org/news/untfhs-waas-iap-survey-human-security>
75. H. Cleveland, "The World Academy in 1993 and Beyond", *World Academy of Art & Science News*, Mar 1993, p2.
76. Ashok Natarajan, "The Conscious Individual," *Cadmus* 2, no.3 (2014): 50-54 <http://cadmusjournal.org/article/volume-2/issue-3-part-1/conscious-individual>

77. Augusto Forti, "A History of the Individual in European Culture," *Eruditio* 1, no. 1 (2012): 53-57 <http://eruditio.worldacademy.org/article/history-individual-european-culture>
78. Heitor Gurgulino De Souza, Janani Ramanathan, Garry Jacobs, Winston P. Nagan, Ivo Šlaus, Alberto Zucconi, "Reflections on the Future of Global Higher Education - WAAS Conference Report," *Cadmus* 2, no. 1 (2019): 62-84 <http://cadmusjournal.org/article/volume-2/issue-1-part-2/reflections-future-global-higher-education>
79. Janani Ramanathan, "Report on Future Education Symposium," *Cadmus* 2, no.5 (2015): 62-72 <http://cadmusjournal.org/article/volume-2/issue-5/report-future-education-symposium>
80. Janani Ramanathan, "Mind, Thinking and Creativity," *Cadmus* 2, no.6 (2016): 118-127 <http://cadmusjournal.org/article/volume-2/issue-6/mind-thinking-and-creativity>
81. Stuart Mudd, *Conflict Resolution and World Education* (Bloomington: Indiana University Press, 1967)
82. Heitor Gurgulino de Souza, Janani Ramanathan, Garry Jacobs, Winston P. Nagan, Ivo Šlaus and Alberto Zucconi, "Reflections on the Future of Global Higher Education," *Cadmus* 2, no.1 (2013): 62-84 <http://cadmusjournal.org/article/volume-2/issue-1-part-2/reflections-future-global-higher-education>
83. Orio Giarini and Mircea Malitza, "The Double helix of learning and work" *UNESCO* 2003 https://unesdoc.unesco.org/ark:/48223/pf0000130713_eng
84. See <http://worldacademy.org/report/gl21-phase-1-interim-report/phase-1-interim-report>
85. Ismail Serageldin, "Five Times Five: Reinventing Education for the 21st century," *The Royal Academy* November 1, 2020 (Paper shared by Private Communication with the full consent of author)
86. The 45 signatories included one philosopher (Russell), one journalist and one businessman and no women.
87. H. Boyko, *op.cit.*
88. Ivo Slaus and Garry Jacobs, "Recognizing Unrecognized Genius" *Cadmus* 1, no. 5(2012): 1-5 <http://www.cadmusjournal.org/article/issue-5/recognizing-unrecognized-genius>
89. Garry Jacobs, "A Brief History of Mind and Civilization," *Cadmus* 2, no.6 (2016): 71-110 <https://www.cadmusjournal.org/article/volume-2/issue-6/brief-history-mind-and-civilization>
90. Jacob Bronowski, *Science and Human Values*, (New York: Julian Messner, 1956).
91. Cleveland et al., *op cit.*
92. Alberto Zucconi, "The Need for Person-Centered Education" *Cadmus* 3, no.1 (2016): 1-26 <http://cadmusjournal.org/article/volume-3/issue-1/need-person-centered-education>
93. Albert Einstein, A. Calaprice (2000) *The expanded quotable Einstein* (Princeton, NJ: Princeton University Press), xliii, 407 pp.
94. H. Cleveland, *op.cit.*
95. J. Bronowski, *Science and Human Values op cit.*
96. Robert Oppenheimer, "Prospects in the Arts and Sciences" in Hugo Boyko, *Science and the Future of Mankind* (Dordrecht: Springer Science+Business Media, 1961), 37.
97. Hans Nordenstrom, "Art and Science", in *New Paradigms: The World 300 Years after Newton* Ed. Sam Nilsson, (Vienna: World Academy of Art and Science, 1990).
98. Umberto Colombo, "Science and Art", *World Academy of Art & Science News*, Mar 1993, p3-4.
99. Mila Popovich and Julene Siddique, "Systemic Engagement of the Arts and Culture: A New Framework for Integral Transformative Strategies," *Cadmus* 4, no.3(2020): 68-92 <http://cadmusjournal.org/article/volume-4/issue-3/systemic-engagement-arts-and-culture>
100. Orio Giarini, Heitor Gurgulino De Souza, Garry Jacobs, Winston P. Nagan, Ivo Šlaus, Alberto Zucconi, "Expanding Network of Networks," *Cadmus* 2, no. 2 (2014):iii-iv <http://www.cadmusjournal.org/article/volume-2/issue-2-part-1/expanding-network-networks>
101. Heitor Gurgulino de Souza, "Call for United Action," *Cadmus* 1, no.2 (2011): 9 <http://cadmusjournal.org/article/issue-2/call-united-action>
102. Marco Vitiello, "Youth's Role in a Fast-Changing World" *Cadmus* 4, no.3 (2020): 57-62 <http://cadmusjournal.org/article/volume-4/issue-3/youth-role-fast-changing-world>
103. Murugesan Chandrasekaran, "Unifying Subjectivity and Objectivity," *Cadmus* 3, no.1(2016): 93-104 <https://www.cadmusjournal.org/article/volume-3/issue-1/unifying-subjectivity-and-objectivity>
104. Oppenheimer "Prospects in the Arts and Sciences" *op cit.*
105. J. Bronowski, *Science and Human Values*, *op cit.*