Colloquia on Science Diplomacy

MMXXII

Edited by
Roberto Antonelli
Giorgio Parisi
Wolfango Plastino

Foreword by
Tibor Tóth

COLLOQUIA
ACCADEMIA NAZIONALE
DEI LINCEI

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Tibor Tóth
Executive Secretary Emeritus of the Comprehensive
Nuclear-Test-Ban Treaty Organization

E se 'l mondo là giù ponesse mente
al fondamento che natura pone,
seguendo lui, avria buona la gente.

Dante Alighieri, *La Divina Commedia*,
Par. VIII, 142-144

But if the world below would set its mind
on the foundation Nature lays as base
to follow, it would have its people worthy.

Paradiso, in *The Divine Comedy of Dante Alighieri*,
a verse translation with introductions & commentary
by Allen Mandelbaum, Berkeley-Los Angeles,
The University of California Press, in collaboration
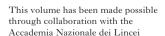with the Schlesinger Foundation, 1982, p. 72.

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ACCADEMIA NAZIONALE DEI LINCEI

Colloquia on Science Diplomacy

The *Colloquia* on Science Diplomacy, organized by the Accademia Nazionale dei Lincei in collaboration with the Ministry of Foreign Affairs and International Cooperation, promote the values of Diplomacy and Science in international relations as fundamental principles to be pursued in the *modus operandi* and the *modus vivendi* of modern society.
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The Third Transition Age?

Tibor Tóth

Foreword
The Third Transition Age?

Intergovernmental organizations are expected, as a *modus operandi*, to stay in their narrowly defined domain. However, in times of utmost specialization, like ours, it is crucial that those organizations that are multidisciplinary, like the ones involved in the *Colloquia* on Science Diplomacy MMXXII, go beyond customary domain limitations and offer a wider perspective. This is a tall order, but one handled well by the entities contributing to the *Colloquia*.

By pulling together in this book the whole *Lectio Magistralis* series, the Science Diplomacy organizers are implicitly encouraging all of us to move out of our disciplinary trenches for the sake of exploring both the 'bigger picture' and the 'longer perspective'. In that spirit, let me first foray into this Foreword with three clusters of speculative questions before offering my own perspective on how to navigate through these demanding times of global challenges and wicked problems.

– From a 'bigger picture' and a 'longer perspective' point of view, we should perceive the last three decades not just as free-standing developments in separate domains, but more holistically, as a major transition underway. Let us call it *The Third Transition* that is driving numerous components of our present economic and social system-of-systems from 'The Old' to 'The New'. The Old system-of-systems has been mostly underpinned by Second Industrial Revolution industries, technologies and services, while the New one is relying mainly on those of the Third Industrial Revolution. While the Third Industrial Revolution has been enriching our economic and social system-of-systems with numberless positive outcomes, could it be that the Third Transition has lasting ramifications by picking winners and losers both within nations and in-between nations? What if no one can opt out of it and skip its knock-on effects?

– In the course of the Third Transition, the legacy economic, technological, scientific, social, political, ideological, societal, and cultural assets might not be eclipsed painlessly. Instead, the

transition may be more complex than promptly installing the New system-of-systems with a smooth change of guard in all those domains. We may be headed towards a volatile and protracted period stretching for one or two generations. Isn't it more appropriate to refer to it as an *age*, The Third Transition Age?

– Looking back in time and focusing on Europe and the US, could we posit that the previous, analogue transition age started four generations ago? Could it have been set underway from the 1880-1890s, triggered mainly by industries and technologies of the Second Industrial Revolution and stretching until the early 1950s? The Second Industrial Revolution, which itself emerged from the 1850-70s, marked unprecedented progress for nations and the world as a whole. While keeping this firmly in mind, we might suggest that the ups and downs of that period be interpreted not as freestanding dots, but as a holistic part and parcel of that transition. We might consider it a transition *continuum*: notwithstanding unparalleled technological and scientific progress, it was still defined by major economic and social upheavals and one continuous world war with a long 'ceasefire'. Moreover, the transition was characterized by left- and right-wing uprisings, civil wars and revolutions, and the breakup of six empires, culminating in communism, fascism, nazism, and barbaric mass annihilations carried out under the control of those radical ideologies – literally decimating the population of the countries affected. Shouldn't we classify this two-generation period, in-between the 1890s and early 1950s, as another mismanaged and degenerated transition age, the Second *Transition* Age?

"This Time is Different"?

Three years after the onset of the Great Recession, in June 2011, in a courtesy call discussion with professor Klaus Schwab, the issue of recurring financial booms and busts came up (*ed. note*: Klaus Martin Schwab is a German economist, founder and executive chairman of the World Economic Forum). The 2009 book *This Time is Different: Eight Centuries of Financial Follies* by Carmen M. Reinhart and Kenneth S. Rogoff provided additional context for our discussion, besides the 2008 crisis at hand. Our organizations, the World Economic Forum and the Comprehensive Nuclear-Test-Ban Treaty Organization, were holding high-level conferences concurrently, in two adjacent, but well-separated wings of the Hofburg in Vienna. Coincidentally, both events explored how

to expand new frontiers of innovation, for economic progress and for international security regulations, respectively.

Based on my personal interest in international security boom-and-bust cycles, I raised a point during our talk. It was about another 'folly': major power arms races and wars unfolding with a recurring pattern, like economic boom and bust cycles. This phenomenon was treated with the same dismissive 'this time is different' attitude and was not getting the analytical attention it deserves, considering the collective tragedy and devastation it causes. The analogy might have resonated with him, particularly in the midst of the historical setting, since his reaction was: "Let's publish an article about it".

To my regret, that article did not get written. Even as of today I would not be in a position to write it. Why? My search has been expanding from identifying nuclear arms race boom-and-bust cycles into a far more complex issue that I cannot wrap my head around: at which conjuncture, and through which interaction, do discrete challenges or wicked problems, already grave on their own, cluster into a socio-economic-environmental 'super bubble', and eventually degenerate into a major conflagration? More importantly, how can we counteract the emergence of such a super bubble in an age of transition? How can we avoid rerunning the degenerated Second Transition Age?

The Third Transition Age

It would be arbitrary to pinpoint one particular event in recent history to spot the beginning of the Third Transition Age. The search for its starting period will have to be even more US-centric than in the case of the Second Transition Age, because of the gravity shift away from Europe to the US and Asia in the second half of the 20th century. While the succeeding paragraphs describe the example of the US in how the Third Transition Age has been unfolding, the main trends of that age could be interpreted and applied wider, naturally *mutatis mutandis*.

After the economic and social malaise of the 1960s and the 1970s, one could observe the Reaganomics in the 1980s followed by the Clinton administration's Rubinomics in the 1990s as responses to the crises. Those economic, taxation and deregulatory policies were paving the way for the rise of the New Economy. They enabled the consolidation of the nascent Third Industrial Revolution industries and technologies and opened the door for the Third Transition Age from the mid-1990s onward.

One indication of the velocity and the volatility of transition in the Third Transition Age is the huge swing of market capitalization towards New Economy companies, similarly to the Second Transition Age. As an example, by the time of the burst of the dot-com bubble in 2000, the market capitalization of New Economy companies in the US was several times higher than the market capitalization of the automobile industry. Within another two decades, the biggest New Economy companies – Apple, Alphabet, Amazon, Microsoft and Tesla – had taken over the top five market capitalization positions in the US (and they were among the world top six), surpassing the aggregate market capitalization value of the biggest companies in the auto, or the oil, or the traditional media industries, or in any other Second Industrial Revolution branch of the economy. At certain periods, these five companies on their own represented nearly one fourth of market capitalization of the top 500 largest US companies.

The reshuffle of the US capital markets meant a massive re-channeling of investments, even if part of that capital originated from derivatives and quantitative easing created by an increasingly inventive financial industry and central bank. Though the rearrangement of the economic landscape was not a zero-sum-game, there was a knock-on effect impacting Old Economy companies. In relative terms at least, it impacted not just their influx of capital, but represented a devaluation risk for their industrial assets, mineral and raw-material reserves, intellectual property and other intangible assets, and, last but not least, their human resources. The top four business sectors by annual revenue in the US – i.e. wholesale trade, manufacturing, retail trade and finance & insurance – have all been undergoing significant disruptions, and their traditional business model has been challenged in the course of the Third Transition Age.

No surprise, there was a definitive push back. The Old Economy was backed up by its protagonists not just in the economic sphere, but in the scientific-technological, political, ideological, social and cultural domains as well, starting a counter-offensive as early as the 1980s. Naturally, the emergence of Reaganomics was preceded from the 1960s onwards by segments of business, finances, politics and academia, promoting deregulation. Thus the roots of the counter-offensive can be traced back even to that period. But in the early 2000s, after the end of a decade-long economic expansion, gloves on both sides started to come off: the Old-versus-New line-up was permeating all spheres – economic, political, ideological, social and cultural – with an ever-intensifying polarization pitching one part of the nation diametrically

against another. The impact of this transition has not been absorbed by the political, financial and regulatory cushions underneath the Old Economy and the finance industry; when the impact has shown up as liabilities accrued, there has been a need for a last resort. The recessions during the Third Transition Age have been shorter and milder compared to the Second Transition Age, especially the 1880s-1910s leg of it. However, the 'Great Moderation', had an enormous price tag: the depression-free economy required massive central bank and costly government interventions and bailouts. Though there seemed to be no realistic alternative, it has been repeatedly proven to companies and banks, which were ready to take more and more risk, that the federal government would always be there as the last resort. As a result, the Third Transition Age has been accompanied by a two-or-ders-of-magnitude increase of national and household debts in the US, jointly reaching half of the annual global GDP.

The level of public and private over-indebtedness, unseen in modern peace times, has been characteristic not just of the US, but also of other G7 and G20 economies. This cluster of economic 'ticking bombs' is waiting for the fatal confluence of the economic, financial and debt crises potentially to go off together.

Top-Down Meltdown or Double Bottom-up Polarization?

While a top-down economic depression has been, at least for the time being, prevented through unprecedented government interventions, a creeping, bottom-up socio-economic polarization has been steadily progressing during the Third Transition Age, both within nations and between nations. The earlier question remains pertinent: how not to mismanage that double bottom-up polarization; how not to maneuver ourselves collectively into an age similar to the degenerated Second Transition Age?

If we first look into how such a polarization has unfolded intra-nationally, we should keep in mind that while markets may rebound even after a severe recession within a year or two, people might not, perhaps even in a decade or in a generation. A recurring series of economic calamities, as happened over the last three decades, has left an indelible socio-psychological imprint on the mindset of individuals and in the collective psyche of the population. The Third Transition Age has left an unshakable conviction with those left behind by it that 'the winners take all'. It is strikingly similar to the 1880s-1910s period when in three decades altogether ten economic downturns, panics, recessions and depressions,

crushed ordinary people's existence and eventually radicalized the bottom income strata of societies.

Globalization became a central economic policy pillar in the US in the 1990s. Decision-makers and corporations were betting on knowledge-intensive segments of the economy and the primacy of finances. They let the Old Economy's industries and services (and the New Economy's assembly work) migrate to emerging economies. However, while those industries and services moved abroad, their workforce was left behind.

The deregulation that unfolded starting from the 1980s enabled Old Economy industries (and the New) to be compensated at the expense of federal and state income by lower or no taxes as well as at the expense of employees by keeping salaries lagging behind profit increases. These taxation and income policies lead to a relative decline of resources available for public health, education and infrastructure. They contributed to a gradual deterioration in income distribution ratios, affecting first the lower-middle class and later the middle class itself.

Deregulation meant additional exposure as consumers for those left behind. They were impacted by big corporations' market and price 'management' practices, especially in the 2020s.

This gradual comparative degradation of livelihoods, living standards, neighborhoods and cities, with all their societal, ideological and cultural consequences, has been further magnified and manipulated through social media, a Third Industrial Revolution innovation.

The Old-versus-New polarization, unlike the recessions of the era, has not encountered a bounce-back recovery. The other way around: it reached new heights in the aftermath of the Great Recession and culminated in social turbulence from the mid-2010s onwards. By now it is another burning fuse in search of an explosive, not just in the US, but in many other parts of the world.

The Third Transition Age has produced winners and those left behind also at the level of nations.

If we look upon the four decades elapsing from 1980, the overall picture emerging on the basis of GDP change reveals the winners and the nations lagging behind. In that same time period, while the world GDP doubled, the GDP of China grew more than thirty times, of the Republic of Korea ten times, of India nine times, of South Asia eight times, and of East Asia and the Pacific six times. Compared to the world average, the US has been 20%, Europe and Japan have been 50% below it, though in absolute numbers they started at a much higher level compared to the rest of the world. The Middle East and Latin America, as well as low

income countries, grew two to three times slower than the upper-middle-income and middle-income countries. The GDP growth of Russia was just one tenth of the world average and nearly 150 times less than China's during those same 40 years.

These numbers, while not revealing all the important nuances, speak for themselves: which regions and countries, lacking the necessary ingredients or determination, have not sufficiently embraced Third Industrial Revolution industries, technologies and services, or, as a deliberate choice, just doubled down on Second Industrial Revolution legacy industries, raw materials and services. In the context of an economic, financial or debt-crisis scenario, the countries lagging behind are the weakest peripheral links in a chain that is already severely strained. The risk they represent is further compounded by their own the Old-versus-New internal polarization.

Under a worst-case scenario, the risks of a top-down meltdown or a double bottom-up polarization might not remain isolated. Rather, they could merge and create a mutually reinforcing feedback loop in a super-bubble configuration leading potentially to a major conflagration.

The repeated references in this Foreword to the need of preventing the rerun of the degenerated Second Transition Age are missing two important points (though for historians there might be a third point: 'It's history' or 'History does not repeat itself').

The first is that a potential worldwide conflict like the one triggered by the burst of 1890s-1910s super bubble should be looked upon not from yesterday's but today's perspective. Alfred Nobel, the inventor of the dynamite, was convinced that the sheer destruction capacity of his invention would put an end to thinking about waging wars in the future. Hiram Maxim, the inventor of the machine gun, prophesized the same. Both of them were wrong, with tragic consequences. Russia, having started an unprovoked and unjustified war against Ukraine, unfortunately does not share Nobel's or Maxim's predictions.

Today's weapons are far more powerful than those of yesterday. We now live in a world where there are not just nearly 20.000 nuclear warheads more than 120 years ago (when there was none), but in a world where there is another 200.000 nuclear warheads' worth of plutonium and uranium in military and civilian stocks, around 200.000 tons of spent fuel scattered around in hundreds of nuclear installations, thousands of chemical plants and biological laboratories storing highly toxic dangerous substances.

The second point missed is that 120 years ago irreversible anthropogenic climate change leading potentially to human extinction

was not an imminent danger. Today it is. Nations do not have the luxury of wasting unprecedented resources and precious time on a mismanaged transition, let alone a global conflagration against the background that an estimated one tenth of the global GDP is required to move towards net-zero emissions by 2050 or one fifth of the global GDP could be lost by the same time in the absence of action.

What's Next?

First, we should understand whether we are indeed going through the Third Transition Age, and if so, in which phase do we find ourselves? Using Second Transition Age analogies, are we in the early 1900s, when the transition degeneration and its mismanagement could still have been reversed? Or, are we in the 1930s, by analogy, when because of fanatical dictators and obsessed nations, the only remaining option was "Keep calm and carry on" and eventually to stand up against them?

Second, shouldn't we admit that we are trying to get our collective head around something that we have not faced in our lifetime, nor in that of our parents, grandparents and great grandparents? Even if our great-great-grandparents tried their best, the previous transition age was mismanaged, at least in the period when it was still reversible. Even if it could have been turned into a smooth transition, shouldn't we acknowledge that we are in a totally different league of complexity in the Third Transition Age because of nuclear weapons, given that one nuclear weapon alone can be an order of magnitude more devastating than all the explosives used in World War I and II? Shouldn't we fully grip the notion that at no time in known human history has a complexity like climate change had to be resolved, let alone climate change on the top of the other wicked problems we are now simultaneously facing?

Third, shouldn't we confess that we do not *yet* have the full set of theoretical, scientific, political, or just the common-sense knowledge and skills to manage the transition better this time? Yes, this is not a winning formula for any election or for any leader, but wouldn't it be a real wake-up call for all of us?

Fourth, shouldn't we reject the resuscitation of any '-ism' from the past or the emergence of future ones, because they turn out to be counterproductive short-cuts, eventually providing false answers to the dilemmas we today collectively face? Shouldn't we all move from ever more radical ideas to more moderation?

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Fifth, shouldn't we repeat again and again that we do not need a magic and omnipotent supreme leader to manage the transition? Instead of over-concentrating on decision-making, we need the contrary: the right amount of collective, distributed and resilient systems of turning data into information, information into knowledge and knowledge into wisdom.

Sixth, shouldn't we most categorically reject any sort of 'beggar-thy-neighbor' policies or practices, wherein the misappropriation of other nations' land, people or wealth is pursued as a way out of the transition's challenges?

Seventh, shouldn't we, in addition to managing each and every particular global challenge or wicked problem we face, collectively focus on how to prevent the challenges and problems becoming intertwined through metastasis?

Eighth, shouldn't we eliminate within each and every organization the 'Hofburg' walls, so that we stand not just under one roof, but in the same "multidisciplinary room"?

Lastly, shouldn't we make sure that this time global challenges and wicked problems do not degenerate into the ultimate socio-economic *tabula rasa*, an outcome totally repugnant and morally unacceptable, as witnessed in the Second Transition Age and so many times in the centuries before?

I hope that the *Lectio Magistralis* series, thanks to the insights provided by the organizations and academia behind it, will bring us closer to these aspirations.

TIBOR TÓTH
Executive Secretary Emeritus
of the Comprehensive Nuclear-Test-Ban Treaty Organization

The *Colloquia* on Science Diplomacy

Roberto Antonelli
Giorgio Parisi
Wolfango Plastino

The *Colloquia* on Science Diplomacy

After the Covid-19 pandemic, the world has been shaken by the crisis created by the Russia-Ukraine war, and at this difficult time, which continues to change the societies in which we live, we are called to care for one another and to avoid closing in on ourselves.

Diplomacy and Science have a common *modus operandi* and *modus vivendi*: *dialogue*. Galileo Galilei – *Lynceus* – the father of modern Science and the author of the *Dialogue Concerning the Two Chief World Systems*, highlighted that *dialogue* always requires new "knowledge", new "interpretations" and new "visions" beyond the contemporary horizon. The tragic geopolitical events of recent months remind us that, despite any conflict, the quest for *dialogue* must be relentless. *Dialogue* encourages critical, rational and objective thinking: through dialogue we can challenge disbelief and prejudice. It is a process that empowers us to strengthen the fundamentals of human coexistence, to identify the common good, on the basis of knowledge and respect for differences. In this context the *Colloquia* fully represented this perspective promoting the values of Diplomacy and Science in international relations as fundamental principles.

At the *Colloquia*, the most important personalities of world institutions and the presidents of the most prestigious world academies discussed topics and future developments of interest for the international community.

The topic on "The Arab World in a Changing International Order" was discussed with H.E. Ahmed Aboul Gheit, Secretary-General of the League of Arab States. The subject was the great power competition impacting dynamics in different regions around the globe, including the Arab region, which is in turn going through a difficult moment marked by transformations and disruptions. It was thus important to analyze how great power competition is seen from the Arab perspective and assess its implication on the regional order. Major Arab States have been facing new challenges as prolonged crises engulfed countries like Syria, Libya and Yemen, with catastrophic human and strategic consequences. The vacuum that ensued from the unraveling of political orders in those countries was soon to be filled by international and regional players as well as by terrorist groups, which

prolonged and complicated those conflicts. In the face of such tremendous challenges, the Arab system, embodied by the Arab League, is fighting an uphill battle to defend the entities of nation states against the many threats they face, in particular militias and proxies as well as regional expansionist ambitions. In the aftermath of a turbulent decade, a number of Arab players look for pathways to de-escalation and peaceful settlements of conflicts, as it became clear that only political solutions could end crises and bring regional stability.

One of the greatest tasks of the 21st century, i.e. confronting global warming, was discussed with H.E. Petteri Taalas, Secretary-General of the World Meteorological Organization of the United Nations (WMO) in his *Lectio Magistralis* on "Climate Change: Impacts and Mitigation/Adaptation Perspectives". Global warming has led to a growing amount of disasters: flooding, drought, heat waves, tropical storms, forest fires and coastal flooding. They last longer and are more powerful than before. The economic losses have more than tripled during the last three decades. Melting of all mountain glaciers and Arctic Ocean ice is speeding up year by year, which is threatening the availability of freshwater to main rivers in all continents and is contributing to sea-level rise: it is expected to continue for the coming centuries due to an already high concentration of carbon dioxide. Oceans have absorbed more than 90% of the excess heat and have warmed, as well as becoming more acid due to carbon dioxide intake. Emissions have been growing, especially in big Asian countries and non-OECD countries. There is a need to dramatically reduce the consumption of coal, oil and natural gas, as well as to stop deforestation, especially in Latin America, Africa and Southern Asia. Energy should be produced by using nuclear, hydro, wind and solar energy, and transportation should be based on electric cars, biofuels and hydrogen. So far, not enough emission reductions have been made to stay on the 1.5-2.0 °C warming track of the Paris Agreement.

The topic on "Global Security and Disarmament Agenda at Crossroads: A Fragmented World or a Cohesive Future?" was discussed by H.E. Izumi Nakamitsu, Under-Secretary-General of the United Nations and High Representative for Disarmament Affairs. Increased polarization among the community of nations, rising inequalities exacerbated by climate change, the impacts of the global pandemic and the global supply chain crisis, heightened intolerance and hate speech, and eroding trust in the capacity of multilateral instruments to find effective solutions to current problems are threatening international peace and security in

ways we haven't experienced in decades. The nature, intensity, and global consequences of the Ukraine crisis are further creating fundamental challenges to the international order. The world needs an urgent course correction that brings Member States and all major stakeholders onto the same page and triggers urgent action to prevent and mitigate conflicts. Disarmament and arms control are fundamental elements of any new thinking on the international security architecture, one that recognizes that disarmament is not a utopian or abstract concept, but a practical component of human, national and collective security. Therefore, an updated vision for disarmament is necessary in order to move away from the reliance on weapons and towards an investment in people-centered approaches, diplomacy and dialogue – a colossal task in today's rapidly evolving international climate.

The main impacts and concerns generated by the Covid-19 pandemic from a migration perspective, and to which the United Nations International Organization for Migration (IOM) continues to respond, were introduced by H.E. António Vitorino, IOM Director General in his *Lectio Magistralis* on "Migration in the Post-Pandemic World". The pandemic led to an unprecedented halt to cross-border mobility: it left families separated, migrant workers stranded, and airports silent throughout much of 2020 and 2021. While travel restrictions have now reduced across much – but not all – of the world, the impacts for people on the move – migrants, refugees, and displaced persons – persist. The uneven treatment of many migrants during the pandemic – excluded from access to services, including vaccination, despite continued contributions in essential sectors supporting communities, such as agriculture, health, and food delivery – has deepened inequalities, from which it may take years to recover. Furthermore, other factors may affect future mobility, from economic fragility and the cost of living, and multiple, overlapping humanitarian crises, to the longer-term impacts of shifting demographics, climate change, and changing labour market demands.

The topic on "The Global Outlook: Short Term Pressures vs Structural Transformations and Reform" was discussed with H.E. Mathias Cormann, Secretary-General of the Organisation for Economic Co-operation and Development (OECD). In this context the priorities are: optimizing the strength and the quality of the post Covid-19 recovery while responding to the economic and social impacts of the war in Ukraine; leadership on climate action to help secure global net-zero by 2050 in a way that is effective and fair; seizing the opportunities of the digital transformation while better managing some of the associated risks, challenges

and disruptions; helping to ensure well-functioning global markets and a global level playing field with a rules-based trading system in good working order; and advancing OECD standards, through membership and partnerships and a sound approach to development.

We, the Editors, are pleased to present in this volume the remarks from each Special Event of the *Colloquia*. We thank the Vice President of The World Academy of Sciences, Professor Sabah Al Momin, the President of the Australian Academy of Sciences, Professor John Shine, the President of the Royal Danish Academy of Sciences and Letters, Professor Marie-Louise Nosch, the President of the Portuguese Academy of Sciences, Professor José Luís Cardoso, and the Executive Director of the Royal Society, Professor Julie Maxton, for their fundamental support.

We also thank the Officials of the League of Arab States (LAS), the World Meteorological Organization of the United Nations (WMO), the United Nations Office for Disarmament Affairs (UNODA), the United Nations International Organization for Migration (IOM), and the Organisation for Economic Co-operation and Development (OECD) for their fruitful collaboration.

A special mention goes to the Secretariat-General of the Ministry of Foreign Affairs and International Cooperation, and to our partners: the Istituto della Enciclopedia Italiana and the RAI Radiotelevisione Italiana.

We express our sincere appreciation to all Staff of the Accademia Nazionale dei Lincei for organizing the *Colloquia*.

Accademia Nazionale dei Lincei
Rome, December 8th 2022

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Vice President
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Colloquia on Science Diplomacy

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The Arab World in a Changing International Order

Pasquale Ferrara

Ahmed Aboul Gheit

Sabah Al Momin

Alberto Quadrio Curzio

and Wolfango Plastino

Introduction
Pasquale Ferrara

The League of Arab States is an organization that brings together 22 nations; countries that differ in terms of identity, culture and tradition; nations with their own history and, sometimes, their own conflicts. These countries have found in the Arab League a forum for discussion that has made it possible to settle the differences between its members and to assert their demands on the international stage.

In times of globalization, constructive cooperation among partners is the indispensable method for effective international governance. These are the means to empower and involve everyone in the search for common solutions to common problems. We recognize the value of this approach to peace and shared responsibility, especially in a fragmented context such as the Middle East and North Africa Region (MENA Region).

Unfortunately, as is well known, it is an area crossed by interconnected factors of instability (institutional fragility, terrorism, organized crime, climate change, migration and currently also the impact of the pandemic) and in which regional interests and dynamics have a significant impact on local crisis.

The rivalry among great powers, combined with the existing regional rifts between Iran, Saudi Arabia-led Sunni Arab states, Israel and Turkey, has had a negative effect on the stability of the MENA Region. The region has undergone a radical transformation since the 2011 Arab uprisings. The promises of the Arab Spring have not materialized. Arab states have either been severely weakened or have collapsed; territorial boundaries are fragile amid devastating, far-reaching transnational conflict.

This results in a highly polarized and fragmented regional scenario, where the parameters of "sovereignty" of many countries in the area appear in question. Non-state actors – militias, jihadist groups, tribes, city-states, criminal organizations – have increased their power and relevance, weakening government authorities and narrowing the spaces for cultural and religious pluralism. The recent crises are a further confirmation of the MENA Region as the

epicenter of hotbeds of tension and the theater of confrontation, open or hidden, between global and regional powers.

Libya is again at a crossroads. We are following with great attention the latest political developments that led to the designation of Fathi Bashaga, by the House of Representatives, with the task of forming a new government. We are urging all Libyan actors to achieve shared and inclusive solutions and avoid any military escalation, while preserving the political, institutional and territorial integrity of the country.

We respect the sovereignty of Libyan institutions. At the same time, Italy stands with the Libyan people. We hear and understand their democratic aspirations. It is essential to keep the focus on elections, which should be based on a solid, inclusive and shared legal framework. The withdrawal of all foreign fighting forces and mercenaries is also a priority.

Instability in Libya could have negative spillovers on its neighbors, starting with Tunisia, which is already undergoing a complex political and economic phase.

Tunisian President Kais Saied's roadmap for political reform is a positive step forward, but there are grey areas when it comes to its implementation. The recent presidential decision to dissolve the Supreme Judiciary Council is deeply concerning. Respect for the rule of law and fundamental freedoms are key.

The economic and financial outlook of Tunisia in the short and medium term is also of concern. We are working with our European Union and G7 partners to help Tunisia effectively address the political, economic and social challenges facing the country, which are interconnected.

Ongoing diplomatic tensions between Algeria and Morocco risk further delaying the establishment of forms of cooperation in the Maghreb region. A more lasting and authentic cooperation between the two countries would be a key factor for the development and prosperity of a strategic area for the interests of Italy and Europe, also through the economic benefits it would bring.

With regard to the Israeli-Palestinian conflict, Italy is committed to breathing new life into the negotiations. From our perspective, only a political solution – based on a viable, just and directly negotiated two-state solution – can bring sustainable peace and security to the region.

We need to recover the spirit and vision of the Oslo Accords, for the creation of two states that coexist in mutual recognition and respect, and the realization of two rights: the right of Israel to exist and live in peace and security, and the right of the Palestinian people to have their own country.

The Gaza crisis has once more demonstrated the unsustainability of the *status quo* and the need to re-internationalize the peace process. In this regard, we stress the importance of the International Quartet, as the only legitimate mechanism sanctioned by the United Nations Security Council (UNSC) to mediate in the Middle East peace process. In addition, we believe that the role of the EU should be reenergized and it should invest its full political capital in diplomatic efforts to bring the parties back to the negotiating table. Italy is ready to give its contribution for this to happen.

Against this backdrop, it is important to stress the importance of the agreements signed in 2020 by Israel with the United Arab Emirates, Bahrain, Sudan and Morocco, which represent a significant development in the broader framework of Arab-Israeli relations. Italy welcomed the normalization of relations between Israel and some Arab Countries as a positive step towards peace and stability in the region. However, this cannot replace, nor be detrimental to, the Israeli-Palestinian peace process. They should proceed in parallel, taking advantage of possible synergies.

Among the most worrisome scenarios in the area, we cannot avoid mentioning the dramatic situation of Lebanon, which is going through one of the most delicate phases in its history. We are deeply concerned about the serious economic and humanitarian crisis that the country is going through.

Therefore, Italy remains committed, through the Italian Co-operation, to supporting the population and contributing to the security of the country through both our participation in the United Nations Interim Force in Lebanon (UNIFIL) and our bilateral training mission (Missione militare Bilaterale Italiana in Libano, MIBIL).

In addition, we continue to encourage the Lebanese government and political class to adopt all necessary reforms to lift the country out of the crisis and to restore trust, and to swiftly complete the investigation into the Beirut port explosions.

With regard to the Persian Gulf states in particular, some encouraging developments within the internal dynamics of the Persian Gulf have been taking place over the last year. First, the relaunch of cooperation within the Gulf Cooperation Council (GCC) after the Al-Ula Summit in January 2021. Although the overcoming of the Gulf rift is uneven, this is a great step forward, since common challenges in the region – such as violent extremism, terrorism and illicit trafficking – can be efficiently addressed only through cooperation. Moreover, we believe that this positive development will also allow the EU and its Member States to

deepen their cooperation with the GCC countries in every possible domain of interest.

Second, the ongoing revitalization of Tehran's dialogue with Riyadh and Abu Dhabi. In particular, the Saudi-Iranian talks on the Yemeni crisis could be a useful contribution towards a regional detente. We are also witnessing Iraq's positive mediation in the region – namely between Iran and Saudi Arabia – whose role as a platform for regional dialogue is also witnessed by the Conference hosted in Baghdad in August 2022.

Finally, as far as regional stability is concerned, we cannot but consider the impact of the Iranian nuclear dossier. We welcome the encouraging news from the negotiations on the Joint Comprehensive Plan of Action (JCPOA) held in Vienna in April 2021, since we believe that relaunching the nuclear agreement represents – in the short term – the best guarantee for regional stability and security, even beyond the region.

Italy, given its geographical location and its history, has a holistic and inclusive vision of the region that goes beyond crisis management. We want to look at a Mediterranean where ideally the shore is one and only one, a circular one, and the contribution that stems from its multiple collective identities and civil society is the most authentic and representative one.

We have a basic conviction: the Mediterranean will be the more cohesive and interdependent the more all the countries bordering it are able together to protect and manage areas of cooperation such as green transition, blue economy, scientific and cultural diplomacy, which we call "Mediterranean common goods".

The "common goods" have been, and still are, a matter of dispute. Nonetheless, in the Italian vision, they embody unique cooperation opportunities, in a win-win logic that can lead to a future of shared stability and prosperity.

Lectio Magistralis
Ahmed Aboul Gheit

We are certainly witnessing a unique and pivotal moment in the history of the international order. This moment had already arrived long before the current crisis in Ukraine, which I consider a symptom of a deeper process. It has been sort of a cliché recently to declare the imminent end of the so-called rules-based order, or the upending of the liberal order that underpinned international affairs and the world economy since the end of World War II. But what was this order to begin with? And how did it come into being?

The current international order is the result of a unique moment where one country, the United States, enjoyed unparalleled power. In 1945, the US accounted for 50% of the global economic output, and more than 75% of world military spending. Such unrivaled status provided the US with an opportunity to form the international system with the aim of avoiding future wars between the great powers.

In my opinion, any international system rests upon two pillars; a certain balance of power between major players, and a sense of acceptance of the global arrangements among the great powers. Henry Kissinger described this sense using the word "legitimacy".

The fundamental premise of the world order that was created after World War II is the sovereignty of nations and inviolability of borders. In establishing this order, Franklin Delano Roosevelt tried to avoid the mistakes of Versailles by incorporating the defeated along with the victors. Roosevelt was also cognizant of the importance of the balance of power. He set up the order in such a way that gives privileged status to certain powers, which are entitled to keep the system – an arrangement that was reflected in the most influential body in the UN system, that is the Security Council. And in order to bolster the order, an array of institutions was set up to facilitate free trade and economic development. Those were the famous Bretton Woods agencies and organizations.

The order engineered by the US managed to weather a cold war with the Soviet Union that dragged on for more than four

decades. It was so successful that some famous thinkers hastened to declare the end of history after the fall of the Soviet Union, stating that the West had no rivals and its way of life, including its political and economic systems, would eventually prevail, and engulf the globe.

That view proved oversimplistic for a very simple reason. Global orders are based primarily, as I described, on the notion of the balance of power. In the decades that ensued after the end of the Cold War, this balance went through fundamental changes. The most significant development in this regard was the rise of China, which was by any measure a miraculous feat, with hundreds of millions leaving the poverty trap and joining the middle class, and growth rates unprecedented in world history.

China's rise is, in my view, the most important phenomenon in global affairs in the last four decades. For one thing, China has achieved its rise, not by challenging the system, but rather by perfecting its tools. Moreover, it has done so through its unique strategy of mixing capitalism with Chinese characteristics. That is precisely what makes it a real rival to the West. China is not a spoiler bent on undermining the system. Some in the US may accuse China of some foul play, but on the whole, China is part of the international system and plays by its rules. It also presents the world with an alternative system, both political and economic, that at least in some aspects, seems more effective than that of the West.

China has its own ambitions of course. For years, the Chinese leaders heeded Deng Xiaoping's advice: "Hide your strength, and bide your time". But with President Xi assuming power in 2012, it seemed that this strategy has entered a new phase whereby China is clearly aspiring to translate its economic achievement into an elevated status on the world scene. It wishes to be respected and dealt with as a great power equal to the US.

China's rise is a clear challenge to the balance of power. Historically, international systems had a hard time dealing with rising powers. Germany's rise at the beginning of the 20th century is one case in point. Some scholars define this perilous situation as a "Thucydides trap" after the great Greek historian who analyzed the war between Athens and Sparta in the 5th century B.C.

China's rise is by no means the only challenge facing the international order today. Other challenges were created by the conduct and behaviour of the American leadership during the unilateral moment in the post-Cold War era. I mentioned the unique role of the US in establishing the system and keeping it since 1945. Through a wide network of alliances, the US remained the number one security guarantor in many parts of the world, including

in Europe, and in the Middle East. The Soviet Union represented a "perfect enemy" which provided the real glue that held this alliance system together. With the unraveling of the Soviet Union, the whole system, as many expressed at the time, lost its *raison d'être*. The US and the Western alliance started searching for a new mission and a new cause.

For more than 20 years, the US adopted an advance strategy predicated on making the world safer for democracy. It engaged in dangerous military adventures, in Afghanistan and Iraq, aimed primarily at regime change. For decades it worked hard to engineer new political realities in these countries, and elsewhere.

I do believe that this advance strategy was not only ill-advised, but also constituted a deviation from the basic pillars and principles upon which the whole international system was established back in the 1940s. State sovereignty and the territorial integrity of nations were trampled upon, under different pretexts. At the core of this new American strategy was an implied premise that one value system, namely the one adopted by the West, is better and more civilized than all the other systems. Unfortunately, the fall of communism led some thinkers, strategists, and statesmen to believe that a certain way of life is destined to prevail in the world. Moreover, some were convinced that it was their mission and their responsibility to engage in a "crusade" to propagate this system, and enforce it on others if need be.

That was a crucial mistake. Through a series of costly adventures, the US realized, the hard way, that it was relatively easy to undermine a country, or to topple a government, but it was extremely difficult to engineer a new political order or create a new sustainable social reality. Nation building, particularly in weak states, cannot be achieved by foreign interventions. The result was devastating both for the countries that witnessed this kind of political experimentation, such as Iraq, and for the United States itself. Costly interventions had the adverse effect of awaking and reinforcing a longstanding American tradition in foreign policy which believes that isolationism is the best way to deal with the world. Such a trend was most apparent during the Trump era, and had a profound impact on relations between America and many countries around the world, including its closest allies in NATO.

Paradoxically, America's so-called unilateral moment paved the way for a new phase of semi-isolationism, whereby the US has been increasingly unwilling to engage in keeping the World order it helped forging.

This situation, coupled with the significant changes in the global balance of power, resulted in a new international reality

marked by great power competition. Both China and Russia harbor ambitions to redress historical injustices inflicted on them. In their view, the current world order does not reflect their weight or match their aspirations. World orders, as I explained, depend on a sense of acceptance. Once this sense is lacking, disorder creeps in and eats away at the rules and principles that underpin the system.

Great power competition is bad news for the world, especially if the relevant powers do not recognize the same rules of the game. It is also bad news for another reason. The conflict between great powers makes it extremely difficult to provide solutions for an array of global problems and challenges that call for a global response. Pressing issues, such as climate change, cyber security, pandemics, and non-proliferation, cannot be adequately addressed in an international environment marked by competition and characterized by mistrust.

All those daunting challenges were not present at the inception of the world order in the 1940s. They are new challenges that emerged as a result of globalization and the increasingly sprawling global network. No single nation, no matter how powerful it is, has the capacity or the will to address those issues by itself, and without the cooperation of other major players. Anyone who followed the UN Climate Change Conference in Glasgow (COP26) in November 2021 has a sense of how difficult it is to reach a consensus on those types of issues.

Great power competition will also have significant impact on regional orders around the world. When great powers are engaged in a struggle for dominance, some ambitious middle powers work hard to gain ground and build spheres of influence for themselves. At times of global instability, those aspiring regional players have more strategic self-determination, so to speak. This dynamic can easily be detected in Middle East.

Our region suffered the most international interventions in the last two decades. Modern Arab states have their failings and weaknesses, no doubt about it. Nevertheless, it has become abundantly clear that foreign interventions, in different shapes and forms, exacerbated Arab problems by putting immense pressures on already weak state structures. Weak states were turned into failed states, as is the case in Syria, Libya and Yemen. We should not also forget how the Iraqi state was devastated and undermined by an American invasion in 2003.

The result was the nightmare scenarios that we all witnessed in the last decade; social fabrics unraveling, state structures undermined, and millions of refugees fleeing conflict zones. Europe itself was not far from the repercussions of the upheaval as hundreds

of thousands of refugees crossed its borders with far-reaching political consequences relating to the migration issue in European politics, resulting in the rise of far-right parties and movements.

Moreover, the regional balance of power was undermined. Non-Arab players, namely Iran and Turkey, exploited the ensuing chaos to interfere in the affairs of Arab states and create proxies, in the case of Iran, or support certain Islamist forces in the case of Turkey. Another neighboring country, Ethiopia, exploited the situation in its own way, deciding unilaterally to build a huge dam on the Blue Nile, without any regard for the interests of other riparian countries, namely Egypt and Sudan, who depend totally on the Nile for their livelihoods.

Political and security vacuums invite interventions. It is an iron law of international affairs. It was not only states that intervened, but non-state actors, armed groups, and terrorist organizations were all eager to fill the void.

Amid the chaos, fundamental historic questions, like the Palestinian question, were sidelined or put on the back burner, with dire consequences for peace and stability in the region. I do believe that without a final settlement to the Palestinian question, one that results in ending occupation and the establishment of an independent Palestinian state, peace and security in the Middle East will continue to be elusive and unsustainable.

Where do we go from here?

The international order and the regional one are interconnected. An international order marked by great power competition, less governed by rules, is not in the interest of regional orders around the world. As a result of the current crisis in Ukraine, some people are beginning to realize how important it is to respect the sovereignty and territorial integrity of other nations, as a founding principle of the international order. We need to stress the fact that disrespecting these guiding principles has led to the weakening of the system in the previous two decades.

In a multipolar world, like the one that is emerging in recent years, no value system or political order has moral superiority over others. No country has the duty, or the right, to intervene in other countries and engineer political orders to its liking. No country, even a great power, has the capacity to enforce its will on other powers, or bring about regime change. This is a fundamental fact of our world today. It is also a lesson we draw from recent history. Great powers need to find a way to live together, because their cooperation is a must to face new challenges. Our experience with the Covid-19 pandemic should enlighten our way forward. A divided world, marked by mistrust and conflict, will fail to mobilize

the necessary capacity and the needed resilience to face the next pandemic, or the looming climate crises.

The same principle should govern regional orders, including the one in the Middle East. Regional ambitions for hegemony are a recipe for disaster. Nation states should be bolstered, rather than undermined by infiltrating militias that fan the flames of sectarian strife. The Arab nation state, with all its woes and problems, is the fundamental political unit of the regional order in the Middle East. The weakening of states was, in my view, a grave sin that opened the gates of hell in our region.

I do not absolve some former leaders, or some political élites of their responsibility. Terrible mistakes were committed in the past, and some continue to be committed in the present. The way forward, however, should not be a repeat of the mistakes of the past. Good governance and the rule of law are two necessary components of any stable state. A number of Arab countries have already embarked on this path, with varying degrees of success. Those countries are trying to build a stable regional order amid immense challenges, against all odds, and in the face of aggressive and expansionist policies by some of our neighbors. Those countries represent, in my view, the hope in a better and more prosperous Middle East in the future. Their efforts to achieve economic development and provide opportunities for their youth should be supported and bolstered by the outside world.

I may have portrayed a somewhat bleak picture. I am a realist by nature, but I am also an optimist. I also believe in diplomacy as an embodiment of human wisdom and rationality. Conflicts and wars are, in the final analysis, a failure of diplomacy and dialogue. Keeping international stability and creating a better future is a choice within our hands. Diplomacy does not recognize fatalism or historical determinism. I believe that the majority of people all over the world have similar aspirations and ambitions. They simply want their kids to lead better lives than they did, and to live in a safer world that provides them with enough opportunity to flourish and prosper. I hope the leaders, and those who take the consequential decisions in the coming weeks and months, in the major capitals around the world, will be up to their peoples' aspirations.

Discussion *

Ahmed Aboul Gheit, Sabah Al Momin,
Alberto Quadrio Curzio and Wolfango Plastino

Wolfango Plastino: *You mentioned great power competition as the main dynamic that characterizes the international order in the current moment. Do you see any lessons that could be learned from the Cold War in this regard? And what are the best strategies for small and middle powers to deal with a world marked by great power competition?*

Ahmed Aboul Gheit: I think the leaders of the different great powers, as well as the leaders of other countries, have to be very cool-headed, because the times are grave. There were also grave times during the Cold War: the Cuba crisis in 1962, the Korean War in 1950-53. But the powers then, and the leaders then, managed to control their senses and to maneuver and to be rational and to think hard about what the consequences of their actions would be. So today we have to be careful, and think hard about the consequences of whatever decisions we take. That is one point.

As for the medium and small powers, they will face very stressful times. During the Cold War, they took positions of non-alignment and neutrality. I wonder if the possibility of the revival of a non-alignment movement is available. If not, small powers and medium powers should unite in order to work with the great powers to bring them together, to moderate among them, to negotiate – to help them to bridge whatever gaps and conflicts there are among them.

Sabah Al Momin: Now, the first lesson that we learn from the Cold War is resorting to sitting and talking – negotiations – to solve conflicts. That is not an easy task. Negotiating between two

powers, which come with the same beliefs but pull in different directions – that takes a long time. To make it work, countries have to develop tolerance and acceptance of ideologies and knowledge of ideologies, to know how to talk and how to approach the other side.

The other lesson concerns the internal capacity-building of countries, and not only from a military standpoint. That was one way that powers followed: building arms and military, to express power relations. That situation may reflect power, but it also gives confidence to the people of that country. That confidence is not merely straightforward, because it also causes stress for the people, and confusion; and so, each approach has its pros and cons.

Now, the other part of this question is what strategies small and medium-sized countries should follow. First of all, they need to promote human rights and the dignity of their people and create healthy societies. They have to learn how to understand others, other policies, other ideologies, other systems, so that they can be open and decide on policies to follow and how to negotiate. They need to build solidarity and allies, and that doesn't mean internationally; it's within. Unification *within* the country, of its *own* people, is the starting point, and having recourse to allies to solve other issues.

Also, they need to build policies to produce a strong economic situation and, coming from the science side, we always believe that science plays a big role in establishing strong economies, and gives these countries stability and a future.

Alberto Quadrio Curzio: One of the most valuable lessons of the Cold War is the spirit of the Final Act of the Helsinki Conference on Security and Co-operation in Europe signed in 1975. It gave birth to the Organization for Security and Co-operation in Europe (OSCE) and was founded upon the so-called Decalogue:
– Sovereign equality, respect for the rights inherent in sovereignty
– Non-recourse to the threat or use of force
– Inviolability of borders
– Territorial integrity of states
– Peaceful resolution of disputes
– Non-intervention in internal affairs
– Respect for human rights and fundamental freedoms, including freedom of thought, conscience, religion or belief
– Equal rights and self-determination of peoples
– Cooperation among states
– Compliance in good faith with obligations under international law.

These are universal principles that should be applied worldwide. In the contemporary world, small and middle-sized powers have a little trouble with regard to how to conduct their international relations in a context of great power competition. They can adopt a mixed policing strategy built on a case-by-case approach and through regional cooperation initiatives like Multilateral Development Banks or multilateral fora.

Wolfango Plastino: *You portrayed a gloomy picture of the Middle East since the so-called Arab Spring in 2011. Do you not see any light at the end of the tunnel? In other words, how can the Middle East overcome its current bleak reality, marked by conflict and instability, and move on to a more prosperous future?*

Ahmed Aboul Gheit: We need people, foreign powers, not to interfere in the internal affairs of Arab countries. We have to give the Arab nation-states the possibility to be revived, to create an internal balance, because interventions lead to lots of competition, and as foreign powers compete, they employ proxies, they employ militias, and the result stands before our eyes in different Arab countries – currently, today, now, as I speak. So, the important thing is to stop interfering. Allow the Arab nation-states to bloom, to rebuild themselves, to apply policies, to apply the rule of law, to apply economic revival, to relaunch themselves. That will not be taking place unless peace and stability prevail all over the region. The situation is particularly sad in Syria: you see different powers interfering all the time, and foreign forces are on Syrian soil all the time, as well as in Libya, as well as in Iraq, and you see foreign influence in different places. So, the recipe is: stop interfering.

Sabah Al Momin: The Arab Spring started with a protest against economic stagnation, poverty, corruption in systems, and this is not a unique thing in the Arab world only. Many countries go through such things.

How to move to a better future? First, we realize that such a prize has been given to us by young people, who acquired knowledge mainly from social media, and created awareness internally and internationally. So, if you look into this statement, it comes down to young people, knowledge, social media, awareness. Science and technology were used for the uprising, for correcting systems. This brought the attention of governments to notice young people and their knowledge and their power, and to notice

the economic status that they are in and to try to make policies to improve and strengthen their economies. It became the starting point for a meeting between governments and people, to start talking to each other. It's no longer one person's or a few people's decision; it's a collective effort. Governments now are aware of the value of science-based and evidence-based policies. They are aware of how to go about things through more collaborations and how to build and diversify economies.

Alberto Quadrio Curzio: The Middle East has the rare opportunity to become the 'connection-hub' between the West (Europe) and the East. The enforcement of the rule of law will also play a positive effect in enhancing regional cooperation and in easing the process of establishing new common regional institutions. In this context, I see cooperation and regional integration possible if managed through existing regional multilateral institutions and new ones. A viable option could be the creation of an Arab Multilateral Development Bank (MDB), which could be sustained as well by the National Sovereign Funds of the wealthiest Arab states. MDBs usually pave the way for strong regional cooperation leading to stability and prosperity. Moreover, by interacting with other regional and non-regional MDBs, they contribute to forming a friendly and multicultural environment and strengthening cooperative relations across regions.

Wolfango Plastino: *Is the Arab League, as a long-standing regional organization, still relevant today given the dramatic transformation in the Arab world and the wider region? What are the main challenges facing it?*

Ahmed Aboul Gheit: The Arab League was established in February-March 1945, six months before the United Nations. And yes, we maintain the best of relations with the United Nations, and we meet in the Security Council once every two years, as heads of the two organizations. The Arab League is composed of twenty-two states. One of them is frozen; its membership is frozen. The League was established among seven states – there were originally only seven regional participants. The idea of the League was to coordinate the actions of these countries, to coordinate their positions – not their policies, but their positions. Every position needed to be coordinated, then the Arab League and the Arab League Secretariat would facilitate the convening of meetings.

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But over the years the Arab League system evolved in a manner that *almost identically* resembled that of the United Nations, whereby we see an ECOSOC, or an Economic and Social Council; then there are ministerial gatherings in every domain. There are foreign minister meetings; there are cultural minister meetings; there are health minister meetings. There are transportation minister meetings. There are ministers of economy, ministers of trade, ministers of agriculture. Then, added to that, a number of organizations were established in all domains to study issues, to suggest policies, and to offer reports to member states. Actually, the system is so broad that even the participants within the system cannot fully identify how it coordinates. And then everybody meets twice a year, in a sort of supreme coordinating body, to coordinate all policies and to suggest courses of action to member states.

The Arab League is not only political; the Arab League is political, it's economic, it's social, it's about security; it has ministers of the interior, ministers of justice. And don't forget, as regards this region – which covers the area between Morocco, to the West overlooking the Atlantic, and Oman in the East overlooking the Indian Ocean – don't forget that it takes you at least eleven to thirteen hours to fly over that area, which has almost 400 million people as its population. They all speak Arabic; *all of them* speak Arabic. So, the culture is there, and the unity of thought is there. And they are mostly Muslims, so the Book and Islam dominates everywhere in that region. The Arab League is not simply pertinent; if it was not there, I would have invented an Arab League to coordinate these actions – a huge organization with a huge population with a huge area with a culture that is equal to any other culture in the world.

Sabah Al Momin: I'm not a politician, and I'm talking from the point of view of a scientist, on how science can play a role in improving the status of regions or countries. We believe that science can guide politicians in the right way. It makes politicians believe, and when they talk, they talk about reality, about evidence. They speak with strength. We can see that the world is changing very fast, and the region is witnessing a fast-paced transformation in different countries from different angles. The Arab League can notice such fast-paced transformation and try to cope with it.

If that path is adopted, the talks and the minds involved in it will be on a different wavelength – on how to strengthen the region, how to strengthen the less fortunate countries in that region, how to make them much more productive, how to educate

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societies, which is a point of strength. Education, knowledge, science research – once we establish this, we are establishing a strong base. Young people especially can stabilize their countries and make them more productive countries, self-sufficient countries, rather than depending on help and donations. Education, knowledge, technology – these issues made the superpowers. You put the power in your country internally. And now the UN has defined the sustainable goals. So, organizations like the Arab League have a target: the goals. It is necessary to organize the region to solve and follow the established goals collectively, rather than each country doing its own bit. This is the scientific point of view.

Alberto Quadrio Curzio: Perhaps some institutional engineering is needed, in order to adapt the existing organization to the contemporary scenario. Again, I stress the economic points. Effective regional integration occurs when steps are taken towards the creation of a common market, the promotion of national economic reforms to support economic growth, the support to human development through appropriate policies of Research and Development and Innovation (R&D&I) investments, and the carrying out of international relations through a common voice expressed within the organization. I believe that the League should create its own MDB, through which it might pursue the realization of the UN Sustainable Development Goals and to improve the Human Development Index. Moreover, an Arab MDB could have the unique opportunity to interact with the existing African Development Bank, which could have a great impact on the human and economic development of the Middle-East and the African Continent as well.

Wolfango Plastino: *How do you see the future of relations between the Arab World and the main Islamic regional players, Iran and Turkey?*

Ahmed Aboul Gheit: Iran and Turkey are neighbors with which the Arab world shares a long and rich history going centuries back. The future with those regional players could be characterized by stability and potential cooperation only if they abandon their hegemonic ambitions over Arab countries. Thus, they have to refrain from interfering in their internal affairs and rather seek to engage in a sustainable relationship with their Arab neighbors based on mutual respect.

Sabah Al Momin: The rapid transformation of the region, policies, and diplomacies are taking new paths of technological intelligence, integration, and science-based economies.

Both countries are highly advanced in science and technology, but the lack of knowledge about their scientific capabilities and potentials is limited. However, collaboration in science is the new way of integration through joint research projects. Institutions of common scientific interests are being established such as Synchrotron-light for Experimental Science and Applications in the Middle East (SESAME), King Abdulla University of Science and Technology (KAUST) which aims to be a leader in S&T and open to students worldwide, and the Organisation of Islamic Cooperation (OIC). Such organizations play an important role in building scientific capacities through exchange and collaborations beyond political situations.

Alberto Quadrio Curzio: I would like to start with a premise. During my long academic and scientific career, I met many scholars and intellectual personalities from these important countries. What I found was that, on the ground of science and cultural issues, there was not much remarkable difference among us.

Let me mention some examples: the UN system including Sustainable Developments Goals, archeology and ancient history, and multilateral development banks. These are not means of avoiding political problems but ways of finding a common cultural ground of trust on which institutional solutions can be built.

Undoubtedly, regional political relations in the Middle East might have deteriorated in recent years. A functional regional cooperation organization, however, might have the potential to turn conflicting interests towards neutral and, possibly, convergent interests, by accruing a degree of mutual trust in the regional actors.

The process of European integration showed quite well that disruptive potential differences, too, could be mitigated by adopting the most adequate and effective integration policies. Actually, functionalism is the most viable tool to design effective policies, and the Arab League might be the most consistent multilateral forum to help design and implement these policies. Both Iran and Turkey are important regional players, distinguishing themselves for their technological and economic advancements, especially during the last years. The best policies are those which are successful in turning national progresses into international political cooperation, bringing national communities to share their scientific and technical goals towards the construction of a common and peaceful future.

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Wolfango Plastino: *Do you still see the two-state solution as the only realistic and viable solution to the Palestinian-Israeli conflict?*

Ahmed Aboul Gheit: I do believe that without a final settlement to the Palestinian question, one which results in ending occupation and the establishment of an independent Palestinian state, peace and security in the Middle East will never be achieved. The two-state solution is the only realistic and viable path to resolve this conflict. Otherwise, if there is no progress in that direction, in a few years we will be left with one reality, which is a state governed by an apartheid system where a minority dominates an oppressed Palestinian people.

Sabah Al Momin: One can hope for the conflict to be solved, whichever way is chosen. As a scientist – and as I mentioned in the previous question – rethinking the approach to find solutions should come through more applied workable solutions.

Palestinian youth and students should be given a chance to develop their own strong, science-based economy in order to improve the quality of life. Such an approach will also allow less dependency on Israeli services. I believe the EU is adopting such an approach along with scientific research collaborations between students from both sides. Collaborative research ought to be of mutual interest, such as in the areas of energy and water. Such efforts will reduce tension in conflict situations. However, increased funding is needed for maximum benefits.

Alberto Quadrio Curzio: I would like to start my answer with a specific personal memory. When I was dean of the Faculty of Political Sciences of the Università Cattolica, I decided to deliver an Honorary Degree to Shimon Peres. In my laudation I said:

"The Faculty of Political Science has decided to award him the Laurea Honoris Causa considering that, in his high political and governmental functions in the State of Israel, Shimon Peres has promoted the peace process with the Palestinian people in an area of crucial importance in international relations, contributing through negotiations to the encounter between civilizations and cultures and to the historical process of cooperation between the peoples of the Middle East".

Some years before, in that faculty, I strongly supported the creation of the chair of "History and Institutions of the Muslim World" held by Professor Valeria Fiorani Piacentini, who created also the CRiSSMA, Center of Research on the Southern System and the Wider Mediterranean.

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She and her team of scholars went many times to the Middle East, Israel and Islamic countries on cultural missions, and by doing so, contributed to understanding along cultural and political lines.

It is also worth mentioning the Peres Center for Peace & Innovation, whose mission is to empower diverse people in Israel and the region to work together to address complex societal challenges and forge innovative new paths for peace. Through its programmes of Regional Business, Entrepreneurship and Innovation, the Center is playing a key role in developing the original concept of the 'Start-up Nation' into the new one of the 'Start-up region'. The rationale of the Center's activity is to build on the intersecting ground of innovation and peace, to promote regional progress, prosperity and peace.

In the words of Shimon Peres himself: "Innovation is not a mission to be completed, but a never-ending pursuit. It is not enough to be up to-day, we have to be up to-morrow".

Other multilateral institutions are playing an intense role in the Israeli-Palestinian context, like the Food and Agriculture Organization of the United Nations, the World Bank Group and other national solidarity funds, which carry out many development assistance programmes, aimed primarily at developing the so-called human capital that is needed to start a consistent evolution. All these multilateral initiatives are the real key to stabilizing the framework of the Israeli-Palestinian relations and to creating a solid ground for peace.

Climate Change

Impacts and Mitigation/Adaptation Perspectives

Giampaolo Cutillo

Petteri Taalas

John Shine

Giorgio Parisi

and Wolfango Plastino

Introduction
Giampaolo Cutillo

Let us not forget that the World Meteorological Organization (WMO) was instrumental, together with the United Nations Environment Programme (UNEP), in the creation of the Intergovernmental Panel on Climate Change (IPCC), with the aim of providing governments at all levels with scientific information that they can use to develop climate policies.

Before diplomacy and negotiations, there are facts and data to be gathered, complex scenarios that create a solid scientific basis enabling policymakers to make predictions and formulate appropriate reactions.

As UN Secretary-General António Guterres recently recalled, human-caused climate disruption is now damaging every region. Each increment of global heating will further increase the frequency and intensity of extreme weather events, and we need early warning systems to protect us against increasingly extreme weather and climate change.

We know that the UN has tasked the WMO to lead the efforts to achieve this goal within five years and to present an action plan at the next UN Climate Change Conference in Sharm El-Sheikh, Egypt,[1] and we applaud their efforts in this challenging and vital undertaking.

If I may expand a bit, I would like to go a step further and say that the freedom of science is crucial to shape a democratic culture and the behaviours needed to maintain and renew democratic processes.

Only education and science enable society to understand increasingly complex contemporary challenges, and to provide workable solutions to problems.

The Covid-19 pandemic has shown how science can and should come to the rescue of governments as they seek policies that strike

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[1] The 27th session of the Conference of the Parties (COP27) of the United Nations Framework Convention on Climate Change (UNFCC) took place in Sharm El-Sheikh, 6-20 November 2022.

the right balance between public health needs and fundamental freedoms. At the same time, it has worryingly shown how casting doubts over science, spreading pseudo-scientific information, and instilling scepticism about the integrity of scientists can quickly fray the fabric of society.

The same goes with the other major challenges we are facing, which are central in today's discussion: energy transition and climate change. Undermining the freedom and integrity of science is a short-sighted, dangerous strategy, with dire consequences for humanity as a whole.

I would like to recall what the IPCC states in its most recent report, whose second part was released in February 2022: "Any further delay in concerted anticipatory global action on adaptation and mitigation will miss a brief and rapidly closing window of opportunity to secure a livable and sustainable future for all".[2]

While this second part focuses on the impact of climate change, the latest contribution looks at climate mitigation and confirms the urgency to act. In order to have a 50% chance of meeting the 1.5 scenario, global greenhouse-gas emissions will have to peak in the next three years, by 2025, and fossil fuels will have to be phased down at unprecedented scale and speed.

In all this, we cannot ignore that our economies and societies, already hit by the pandemic, are now facing the most serious political, military and humanitarian crisis in Europe since World War II – a conflict that radically changes the geopolitical, strategic and security framework against the backdrop of an emergency (that of climate change) which is no less disruptive.

In this context, already characterized by an unprecedented rise in energy prices, the need to ensure our energy security now adds to the challenges related to the structural transformation of our economies to tackle global warming.

As of now, we have to disengage the EU as a whole from the current, excessive dependence on Russia's fossil fuels.

Energy diplomacy shows all its crucial importance at this stage. At the national level, we are resolved to accelerate energy diversification, seeking alternative supplies and strengthening collaborations with reliable partners in the Mediterranean and beyond. Developing these collaborations is an investment in our common

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[2] *Summary for Policymakers*, p. 33, in IPCC, *Climate Change 2022: Impacts, Adaptation and Vulnerability*, 2022 (https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf; https://www.ipcc.ch/report/ar6/wg2/).

stability and future shared prosperity, in a region rich, even more than in gas and oil, in inexhaustible natural resources for renewable production.

We must remember that the energy transition is the only long-term solution for our energy security and for the freedom of our countries from the dependency on fossil fuels.

Accelerating the clean energy transition remains therefore our common strategic goal for the autonomy and resilience of our energy systems. The national security paradigm has been a great mobilizing force, greater perhaps than the knowledge of impending global climate catastrophe.

The idea of renewables representing "freedom energy" is likely to trigger a further, unprecedented level of focus and spending on clean energy.

The good news is that, according to the latest part of the IPCC report I was citing before, a lot of what is needed is underway.

The study shows that between 2010 and 2019, prices of green alternatives to fossil fuels have plunged, with the costs of solar power and lithium-ion batteries falling by 85%, while the cost of wind energy dropped by 55%. Solar panels and wind turbines can now compete with fossil-fuelled power generation in many places, and the deployment of green technologies has increased significantly.

Accelerating the clean energy transition means accelerating the fulfillment of our strategic autonomy, our independence and resilience. It also leads to additional GDP growth, employment and social inclusion.

From the European Green Deal to the Fit for 55 package of measures, to the most recent RePowerEU, Europe has created a series of tools for a sustainable and zero-emission future, setting the goal of climate neutrality by 2050, while reaffirming Europe's global leadership in the fight against climate change.

In that regard, in 2021, as G20 Presidency and partner of the UK for COP26, Italy made an important contribution to reinforcing the need to keep the increase in global temperature within the threshold of 1.5 Celsius degrees.

We are committed to preserving our legacy, making the most of the fleeting window of opportunity that we still have in order to build on our progress, without returning to anachronistic and destructive patterns.

Also from this point of view, war is the most incoherent and anachronistic thing that can exist, a disheartening sight in the eyes of the girls and boys who are peacefully fighting to save the planet, and whose vision and values of the future we are committed to bringing forward.

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Lectio Magistralis
Petteri Taalas

I would like to discuss some material from what the World Meteorological Organization (WMO) has compiled concerning climate science and disasters and what the most recent Intergovernmental Panel on Climate Change (IPCC) report shows. This recent IPCC report was published in three phases: the physics one on 6 August 2021, the impact report on 27 February 2022, and on 4 April 2022, the mitigation part of the report. I will discuss the most recent findings from those reports.

Since 2016, I have been leading the WMO, which is the UN specialised agency on weather, climate and water; practically all of the UN members are also our members. In 2023, we are celebrating our 150th anniversary. We are not as old as the Accademia Nazionale dei Lincei, but we are the second-oldest UN agency, having been established in 1873 as the International Meteorological Organization for the free exchange of data and the standardization of global meteorological instrumentation. Our work is very much done by our members, and Italy is one of our important members. We also deal with hydrological services and academic institutions, and we have opened our doors to the private sector. We are managing such a huge amount of data nowadays that it's important that, for example, Microsoft- and Google-type data providers become more active members of our family. As we have just heard from the previous speech, we are the second founding father of the IPCC, and we are also hosting the IPCC.

I'm personally a member of Secretary-General António Guterres' climate core group, and he has just given us a mandate to prepare a major early-warning service package for the next Conference of the Parties (COP27). I will meet the COP26 President, Alok Sharma, in Geneva, and I'm going to visit Egypt in the coming weeks to discuss this with them; they are also very enthusiastic about this initiative.

We have been setting global observing systems, consisting of ground-based observations, satellite measurements, and balloon-borne aircraft vessel measurements, and we also monitor the

global status of greenhouse gases. We have carried out major reforms over the past years; we are now looking at the Earth as a unity instead of dealing with weather, climate, water and oceans as separate items. We are happy to see a merging of services to discuss the hazard early-warning services. We have established two new scientific bodies, and we are getting advice from leading scientists on the future of our field, how the world may look ten to twenty years from now. That's the Scientific Advisory Panel and Research Board. We also have the services body for the sciences, and the private sector is becoming more and more important for us. We have a very active role in communicating the results of climate science, as I am doing today. Our meetings have become fewer, and we are paying more attention to the outcome of our meetings. We have plenty of partner organizations in the UN family, and we have joined forces with many of them. We are also supporting less developed country members with our expertise.

We have a very nice planet to live on, at the right distance from the Sun; we have the right composition of gases; we have water and we have oxygen in the system. But we have started changing the system. The temperatures globally have visibly changed. We have reached 1.1 to 1.2 degrees warming so far, and we have been breaking records year by year. In Italy, the European record was broken last year with 48.8 degrees in the southern part of the country. Maps displaying the variation in temperature show that the Arctic and the northern continents have been warming the most, and we also have some cooling, especially south of Greenland and Iceland; the so-called Gulf Stream, which brings warm air from the Caribbean towards Europe, has slowed. And this is a reflection of the melting of Greenland's glaciers.

We are not breaking the temperature records year by year; we have this El Niño/La Niña year, we break records. The last strong El Niño year was 2016; thereafter we have seen more of these La Niña years, but when the next El Niño year comes, we will already be fairly close to the 1.5 degree limit, the lower limit of the Paris Agreement. As I said, southern Italy broke the all-time European record; last year we also broke the all-time Canadian high in western Canada, and we have seen three years in a row of 38 degrees at the Arctic Circle in the Russian arctic. So those are all indications of climate change, and we will certainly see such records broken also in the future.

If we compare what has happened in the past hundred years, our situation is quite unique, since for the past 2000 years (which we can reconstruct by using indirect methods, along with estimations of what has happened in the past few hundred thousand

years) we have already exceeded that variability range, the ice age variation range.

We have broken records in many greenhouse gases, carbon dioxide, methane and nitrous oxide, year by year. What has happened to methane is a bit of a mystery; we don't fully understand all the sources of methane, and also we have a limited understanding of the sinks of carbon dioxide, especially through the oceans. The Covid era led to a drop in emissions in 2020 by 5.4%, but the lifetime of carbon dioxide is so long that this kind of one-year anomaly doesn't change the big picture. And since then, we have almost returned to the 2019 emission levels.

We have an idea of the relative importance of greenhouse gases behind observed warming so far; of these, carbon dioxide is responsible for two-thirds of the present warming, and methane is responsible for one sixth. Methane's life is only 11 years, while the impact of carbon dioxide stays in the atmosphere for hundreds of years, so that's the most important challenge that we have ahead of us.

I will quickly mention the carbon budget, or what has happened since 1850 with carbon. By far the greater percentage comes from the impact of fossil fuels, and a smaller amount from land-usage change, especially deforestation. About a quarter of the emissions go into the oceans, a quarter go into the land, and the rest remain in the atmosphere. Clearly, fossil-fuel use is dominating the picture.

We have stored more than 90% of the extra heat in the oceans, and the oceans have become warmer at various different depths. This is observed everywhere. We have also changed the chemical composition of the sea waters, since oceans act as a carbon sink, and now they have become more acid; according to estimates, they are at their most acid level in 26,000 years.

As for sea-level rise, twenty years ago we used to have about 2 millimetres per year sea-level rise, and recently we exceeded 4 millimetres per year. This boost is very much coming from the accelerated melting of glaciers. There is also a component coming from the thermal expansion of the sea water, but the situation is a bit striking. The IPCC has estimated what's going to happen to the sea-level rise by the end of this century, and of course it depends on emissions, but in any case we expect to see between half a metre to one metre of sea-level rise by the end of the century. By the end of next century it may be up to two metres if we reach the Paris 2 degrees target, while if we don't reach this target, we might see up to a seven metre sea-level rise. One of the negative facts of climate science is that we have already exceeded 400 ppm

of carbon dioxide, which means that the melting of glaciers won't stop even if we stop emissions. So that will be a long-term challenge that may be with us for the coming hundreds of years.

In English-speaking countries, we speak about 'global warming'; that's a little misleading, because the biggest impacts of climate change are felt through water and changes in the precipitation. We can see what has happened to rainfall amounts in recent decades as compared to the early decades of the last century; for example, Africa, Southern Asia and parts of Latin America have become drier, and the high latitudes, especially in the Northern Hemisphere, have seen an increase in rainfall amounts.

As far as glacier melting is concerned, we can see that there has been a boost in glacial melting, and as I said, this may continue for the coming centuries, which may have major negative impacts on the fresh-water availability in many rivers in all continents. We have seen the biggest changes in the Arctic, and that's because of this melting of snow and ice from the region, and both spring and autumn sea-ice coverages have been shrinking. We have melted already more than 70% of the sea-ice mass; so-called multi-year ice has disappeared from the Arctic.

In 2021, we also saw several disasters worldwide. There were severe flooding events in India, China, and also in Germany, and heat waves were also fatal in North America, in Canada and the USA. We have seen droughts in Africa and Asia, and also one hurricane which caused about 64 billion dollars of damage in the USA. There is already science showing that these two events, for example, would not have been possible without the impact of climate change – the heat waves in Canada and California, and also the flooding event in Germany, which caused 200 casualties. In Germany's case, this demonstrated that collaboration between meteorological and hydrological services didn't function optimally; if there had been better cooperation, we wouldn't have seen those 200 casualties.

Rome is hosting the Food and Agriculture Organization (FAO), which estimates what is happening to global food security. In the long run, we have seen a decrease in food insecurity, but in recent years we have started seeing an increase again. There is a climate component behind that; Covid has also had an impact, and most likely this Ukraine crisis will even further have a dramatic impact on food security worldwide.

During the past twenty years, more than half of the global population has faced major natural disasters. About two billion inhabitants have faced a flooding event, 1.5 billion a drought event, and about 700 million a tropical storm event. According to the

IPCC report which was published in February, these disasters have become more frequent, and they have a bigger impact than before. The economic losses have grown five-fold since the 1980s. We can see the disasters that have led to the biggest amount of casualties; we can see especially flooding and drought events hitting several less-developed countries, with up to 300.000 casualties. Thanks to improved early-warning services, we have been able to see a decrease in those numbers. But if we look at the economic losses, there we have seen a dramatic increase, and the most expensive ones have been in tropical storms, hurricanes hitting the USA, and flooding in China and Thailand, for example; but if we divide those with the sizes of the respective economies, the small economies have suffered the most. In the Caribbean, we have seen Gross Domestic Product (GDP) losses up to 800% a year, in Dominica, for example, in 2017. And in African countries we have seen GDP drops between 15 and 20% after flooding or a drought period.

In North America, South America, Europe, Africa and Australia we have seen a global increase in heat extremes, excluding in the southern part of South America. We have also seen increases in flooding risk, especially in the Eurasian continent and some parts of Africa; North and South America have also been facing an increase. We don't have enough observed data from many regions to say what has happened to them; we have to enhance our observing systems.

As far as drought risks are concerned, the Mediterranean region is one of those where we have started seeing an increase in drought events; this is also very much the case in the Middle East and also in several parts of Africa and Eastern Asia.

The Working Group II report in February also demonstrated where we have the most climate-vulnerable regions; Africa and also the southern part of Asia and some parts of Central America are the most vulnerable regions according to the IPCC.

If we look at the various climate risks, which are very much related to the Sustainable Development goals, we can see that Africa has practically all of the vulnerabilities that can be imagined; Asia, some of them; and Europe, many fewer than the other parts of the world.

The International Monetary Fund (IMF) has estimated what kind of impact the current one-degree warming has had on the global economy; the Southern Hemisphere and tropical, low-latitude areas are strongly negatively affected, and only the high-latitude areas of the Northern Hemisphere have gained; it's had a productive impact on temperatures and rainfall amounts, and less

energy for heating is needed. Whereas the southern part of the world has suffered.

The IPCC published its *Global Warming of 1.5 °C* report in 2018, where they demonstrated that, for the welfare of mankind and the biosphere, 1.5 degrees would be the desired outcome. If we are to reach that goal, as we just heard from the Ministry, we should bend the emission growth during the coming five years, and then we should become carbon neutral by 2050. To reach 2 degrees we have twenty years more time to bend this emission growth curve, and then we should become carbon neutral by 2070.

The good news is that we are no longer heading toward 3 to 5 degrees warming, which was the message of the IPCC report in 2014. So some progress has been made. I will come back to that issue later on.

The Working Group I report from August demonstrates what is supposed to happen to rainfall amounts, and especially soil moisture, which very much drives the agriculture conditions. Whether we suppose 1.5 degree warming, 2 degrees warming or 4 degrees warming, in all these cases, for example, the Mediterranean region is going to be drier, and this will be a challenge for agriculture. The same is true for both Americas, the southern part of Africa and also the eastern part of Asia and Australia. And that to me is the main concern related to climate change: what's going to happen to the global agricultural conditions, and how we will feed the growing population. If we go to 4 degrees warming, the problem will become fairly dramatic. For example, the Amazonian region could become a desert in that case.

That's why we have created the global Water and Climate Coalition, to pay attention to this water challenge, and that's going to be endorsed by the COP27; water will be one of the hot topics of the next climate conference. If we look at the hot spots globally, we can see the Mediterranean, the Middle East, Southern Asia, Central Asia, Eastern Asia, and also both Americas which are at risk in that sense. If we overlay the water challenge and the population-growth challenge, we can see that Africa is clearly facing a major challenge, especially since they're going to see four billion inhabitants by the end of this century. Also the Middle East and South Asian countries are going to be challenged from that perspective.

According to estimations of world resources, we have an idea of what would happen to the global crop yields if we reached 3 degrees warming; and we can see that most parts of the world would suffer, and those areas which may benefit from these changes are not the most suitable for agriculture, so that would mean that we would have difficulties in feeding the global population.

Consider what has happened to greenhouse gas emissions during the past thirty years up to the end of 2019. Carbon dioxide is the dominant one; this is followed by land use, then methane, nitrous oxide and fluorinated gases. We know fairly well what the consumption of fossil fuels is like, but the land-use part is very unknown; there is a fairly wide range of uncertainty, and that's why we have from the WMO side a new initiative to improve the greenhouse gas budget monitoring system. There are also some uncertainties concerning the sources of methane, as is also true for nitrous oxide.

As far as world emissions are concerned, Eastern Asia is clearly the dominant source, then North America, and Europe is only contributing 8% of the emissions, which demonstrates that Europe alone cannot solve this problem. We have to get these East Asian countries on board; that means China, India, Vietnam, and Indonesia, where emissions have been growing fairly rapidly recently.

If we overlay the impact of fossil-fuel use from different regions historically onto the land-use challenge, we can see that Europe has mainly been responsible for the fossil-fuel part, but if we go to Asia, Africa and also Latin America, there has been quite a big contribution coming from deforestation. This demonstrates that no region is innocent when it comes to the current climate problems. In Western countries, we have used the most fossil-fuel resources, but deforestation has also had a major impact, and we should bring a stop to it in the Amazonian region, Africa and Southern Asia, as for example in Indonesia. These areas are very much responsible for this.

The good news, as my colleague from the Ministry has already noted, is that the prices of renewable energy have been dropping dramatically, especially photovoltaics and wind; the price of electric batteries and electric vehicles has also been dropping. It is fairly encouraging to see that these things are becoming affordable, and they are even attractive for investors.

The IPCC has estimated the pathways toward 1.5 or 2.0 degrees, and what would happen if we do not change our behaviour enough. They have also estimated what are the most economically attractive ways to be successful in climate mitigation, and the top two are solar and wind energy. There are certain very low-cost investments needed for success. For example, in the transport sector, we have electric vehicles, electric bikes and public transportation and so forth. Nuclear energy is also a powerful way to fight against climate change, but it's a bit expensive. That's one of the challenges that we are facing here.

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The IPCC have also estimated how much money is needed for successful climate mitigation, and where additional investments are needed. Especially in the developed world and Eastern Asia, one needs to invest much more to be successful in climate mitigation. That's also the challenge for European countries. We clearly have to invest more financially to be successful in mitigation.

This is the problem in a nutshell: at the moment, 85% of the energy that we use for energy production, industry and the transport sector are based on coal, oil and gas, and only 15% is based on nuclear, hydro and renewables. We should invert those numbers in the coming decades to be successful in climate mitigation. In many countries, we should also build more nuclear energy – in countries like China, India, and perhaps Germany, it's very difficult to meet that need through solar and wind alone. That's one of the challenges ahead of us.

The European Commission has been reasoning on how to become carbon-neutral by 2050. In the EU, power production is the biggest source of carbon, with transport at number two, and industry number three; then we have for example methane coming from agriculture, and also residential sources, especially from the northern parts of the European Union. Carbon sinks play a role, especially the forests, and this is important, but it's not the big picture. So far we don't have much ground to hope for carbon-removal technologies, so that's still a fairly marginal aspect of the problem according to the European Union's reasoning. They currently think that if we reduce emissions by 90%, the rest will be taken care of by carbon sinks and slight carbon-removal technologies.

One of the facts behind this challenge is that at the moment many of the products that we consume, including our mobile phones, and many other things, are produced in China, where the backbone of energy is coal-fired energy. But we are the ones who are very much consuming those products in Europe, and also in North America and Japan.

If we consider the flows of fossil energy, we see that so far we have been very much using Middle Eastern and Russian fossil energy, and it's very likely that European countries will reduce the consumption of Russian fossil energy dramatically as a consequence of this war. But we may use a bit more from Middle East sources of energy, and also from other sources. In the long run, I expect that we will reduce the consumption of fossil energy in general as a consequence of this war. For the coming years things may look somewhat different, but five to ten years may look already fairly positive from that perspective.

Finally, some good news: we have seen thirty-two countries which have reduced their emissions during the past fifteen years, although their economies have been growing. These are mostly European countries and developed countries, but this demonstrates that there is not an automatic link between emission growth and economic growth.

So far we are not heading towards 1.5 to 2 degrees warming; we are moving toward the 2.5 to 3 degrees range, although the Glasgow COP Conference was partly a success story; the G7 countries and the European Union in particular were able to make pledges that would keep us on the 1.5 degree pathway, but the big Asian economies were not ready to do so, so far.

Finally, some political dimensions. The main concern from my perspective is going to be what's going to happen to global agriculture. We have plenty of regions which will suffer because of this change. It was already shown a long time ago that it is much cheaper to mitigate climate change than to live with its consequences, and that's of course still valid. We have to invest now, and the benefits will be seen in the long run. What's going to happen to oil- and gas-dependent economies – of course, Russia is a very urgent case, because of the war – but also what's going to happen to the Arabic economies in the long run, if the world stops using fossil energy?

Africa is clearly a challenging region. The economies of many African states are highly dependent on rain-fed agriculture. That's also their employment, and that's also their life-and-death issue. If this population growth up to 4 billion takes place, it's going to be a total mess.

In Europe, the southern part of Europe will suffer. We will have less rainfall here, and higher temperatures. The immigration potential also affects the whole of Europe, but the southern part of the continent has especially felt this.

Discussion *

Petteri Taalas, John Shine, Giorgio Parisi
and Wolfango Plastino

Wolfango Plastino: *Is climate change a real problem or just natural variability we have seen in the history of Earth?*

Petteri Taalas: It has been very much debated in the past whether climate change is real, and it has been said that we have seen natural variability in the past. And that's very true. The geometry between the Sun and the Earth has varied, and it has caused, for example, ice age variation. We have also seen warm periods in the past, but this is now the first time that manmade impact on climate has been seen. The theory of the impact of greenhouse gases on climate is physically very solid. It's been shown that this is a scientific fact.

John Shine: Climate change is a very real challenge. Global mean surface temperature has increased by 1.1 degree since the beginning of the industrial period. In the late 19th century alone, there has been a steady documented rise in global temperatures, now well outside of anything we could call natural variability. We are at 1.1 degrees now, and we've seen the impacts worldwide. Even with current international commitments, we are likely to shoot past the 1.5 degrees before the end of the century. And even holding to a temperature below the Paris Agreement target of well under 2 degrees, things still look highly uncertain.

Giorgio Parisi: Let me speak about the global average temperature on the entire Earth, over a period of one year. It's clear, as we have seen by the charts that have been presented before, that sometimes we have an increase of 10% in one part of the planet,

and in other parts of the planet we have a decreasing temperature. So the important thing, the thing that is most solid and most reliable, is the temperature average over all the world.

Now, we know that this quantity changes from year to year, by just over a tenth or two tenths of a degree, and fluctuates around an average. One year it is higher, and one year it is lower. This is just the fluctuation from one year to the next. On top of this fluctuation, there are some long period trends. For example, the temperature that we have now is more or less slightly higher than the temperature during the Altithermal Period on the Earth, which was some 8000 years ago. And this Altithermal Period was likely the warmest period in the last 100.000 years.

We have seen, in recent years, essentially more than one degree of temperature change in one century. And this is a staggering increase of temperature, one which is unprecedented. Indeed, if we go back to the Altithermal, from the Altithermal on, the temperature dropped as little as two tenths of a degree every 1000 years. And we have just recovered all the descent that happened from the Altithermal to nowadays in 8000 years, and we recovered it in only a single century. So things are changing very fast, much faster than in the past, without any other apparent reasons, such as volcanoes and so on. That is important, because we know that we have a varied change in temperature due to volcanic eruptions, due to meteorites, and similar things; but we have seen nothing which could justify, on the basis of natural causes, this type of variability; it is unprecedented.

Wolfango Plastino: *What are the biggest risks caused by climate change so far and in the future?*

Petteri Taalas: We have built many of the big cities worldwide in low-lying coastal areas. That's the case in China, India, Vietnam, Thailand, and in some African cities. Many European cities are located in low-lying coastal areas. The same is true for several North American cities. So that's going to be a challenge, while at the same time urbanization is happening. And then we expect to see intense tropical storms in wider areas than we used to have in the past. For example, this spring we have seen record-breaking cyclones hitting Madagascar. There have been altogether five cyclones with severe flooding impacts affecting Madagascar. And as I said already in my presentation, I'm mostly concerned by the impact on global food production and capacity, and what's going to happen in the less-developed world in that respect.

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And then, the melting of glaciers is going to endanger the availability of fresh water. The Himalayan glacier affects the amount of water in Indian and in Chinese rivers; here in Europe the Alpine glaciers are the origin of several rivers; in North America, the Rocky Mountains have a similar impact, and in South America the Andes. So that's one of the long-term challenges: how to get enough fresh water for human beings, for industry and for agriculture.

John Shine: Worldwide, we're seeing growing impacts of climate change on the frequency and the intensity of extreme weather events and climate-related disasters. We are witnessing their impacts on supply chains and primary production, their impacts on human health. Heatwaves, droughts, cyclones, floods, fires – all are increasing in intensity.

In Australia, we've recently seen many climate-related disasters, including major continent-scale bush fires, heavy cyclones, extensive coral-reef bleaching on the Great Barrier Reef, and record-breaking floods. The town of Lismore was completely inundated in March 2022 with what was described as a one-in-five-hundred-year flood. But then again at the beginning of April we had another major flood in that town. These have had devastating impacts on people's lives.

In the future, these disasters are almost certain to become more intense. Impacts on human systems will become more and more marked, with health effects becoming more pronounced and prevalent. Our economic systems will probably be fairly seriously disrupted, and food security may be compromised.

I mentioned the Great Barrier Reef in Australia, which is actually unlikely to survive if global temperatures rise above 2 degrees. But ecosystems that we rely on for clean air and water, crop pollination, pest control and other services, will all be disrupted and severely altered.

Giorgio Parisi: I think that most of the important points have already been covered. Let me stress that we have seen a sea-level rise of more or less thirty centimetres in the last thirty years, and this trend gives no sign of decreasing. Maybe it won't increase for the moment, but it's clear that, in the long run, this might be an extremely dangerous problem for coastal areas, like Venice in Italy.

Now, I think that the other point that has already been stressed is that extreme events, like floods, hurricanes and so on, will become more and more frequent. And this is clear. One of the big

effects of global warming is to increase the atmospheric circulation from the equator to the North Pole, and this will increase the kinetic energy in the atmosphere. That obviously carries more energy, and there will be a situation which may include a great heat wave coming from the South, or a great cold wave coming from the North, and thus extreme events will become more and more frequent. And we know that when we have an extreme event of one kind or another, it is clearly extremely dangerous, especially because sometimes these extreme events are associated with catastrophic rainfall.

One problem that I think may prove the greatest danger is the unpredictable change in the pattern of rainfall. You have seen that in some parts that were supposed to have more rain, there, for any number of reasons, we actually see less rain. And clearly this is a terrible danger for agriculture. It is not easy to relocate agricultural activity from one country to another. In the Altithermal Period, the Sahara area was occupied by a big lake, and the Chad Lake is what remains of it. But if we had more increase in the rains in the Saharan and central-African regions, and we had a stop to the monsoons in India and China, it is clear that the latter would be a huge disaster that is not mitigated by the former.

I think that one other big risk of climate change is that, actually, due to the action of man, the natural environment is more fragile, because the regions of natural resources are decreasing. We see most of Europe is no longer in its original natural state, and so the change of temperature is going to cause the extinction of an impressive number of species. We have all the seen tendencies that are leading toward a mass extinction, the traces of which will remain in the future for hundreds of millions of years from now.

Wolfango Plastino: *What are the main factors behind the observed climate change?*

Petteri Taalas: What we also saw in my presentation is that deforestation has had an impact, and that's also something that we should stop. We should try to grow more forests, at the expense of deforestation. But carbon dioxide is the main problem, with methane as number two and nitrous oxide number three. Deforestation, especially in the Amazonia region and some parts of Africa and some parts of Southern Asia, should be stopped as well.

John Shine: Greenhouse gas emissions are far and away the biggest factor. Emissions from power generation, our cities, the

transport sector, agriculture and land use. The physics of this has been very well documented for a generation now. These gases trap heat from the Sun in the atmosphere, causing environmental warming.

Giorgio Parisi: It's clear to me and to most of the people who have deeply studied this problem that human behaviour is the main factor; it is mainly responsible for this climate change, through the effect coming from the emission of huge quantities of CO_2 into the atmosphere, and also methane from livestock, from agriculture practices; these two gases have a strong greenhouse effect. Now we are setting deforestation on top of this, as we have all just mentioned. And on this point there is presently no doubt that the increase of CO_2 (just to put things in their simplest form) is strongly correlated with the increase of temperature. The temperature increase which we have seen was predicted, albeit with a large margin of error, forty years ago, by two climatologists who have won the Nobel Prize in 2021 together with me (*ed. note*: Syukuro Manabe and Klaus Hasselmann). Now, there have been accurate models which have been made, the margin of errors have been extremely reduced, and the human origin of climate change is certain beyond any reasonable doubt.

Wolfango Plastino: *Do we have the means to solve the problem, and what are they?*

Petteri Taalas: The good news, which is also coming from this most recent IPCC report, is that we have the means to be successful in climate mitigation, and the price of those solutions have become lower. We can stop using fossil energy in the energy sector and replace it with nuclear, hydro, solar and wind energy. In transportation, we have a growing amount of electric vehicles on the market; their prices have been dropping, and I'm convinced that they will drop further during the coming years. We can also consider using some biofuels, and it's likely we will also have hydrogen as a new available solution.

In our everyday diet we are eating a bit too much meat, and to produce that meat we have been using 70% of our farmland for feeding the cattle. The deforestation of tropical rainforest areas is also connected; one of the reasons behind that is that we produce, for example, soybeans for cattle. We could eat a little bit less meat, and that would also be a good solution. And also there are energy saving solutions like heat pumps, which could be part of the solution.

John Shine: We need to decarbonize the electricity supply and transition away from fossil fuels. We need to couple that with electrified transport and energy systems, removing fossil fuels from these systems as well. We need to improve energy efficiency in all sectors, and provide support for low-energy options in design and building. We also need to deploy carbon-reduction technologies at scale, and we need to continue to research options for carbon sequestration and negative emissions. We need to preserve and expand existing carbon sinks, especially things such as mangroves and forests. The IPCC has given us a roadmap. They've given us a comprehensive description of the problem, and have highlighted what the solutions are. We need to follow this roadmap.

Importantly, though, we also need to make sure that we adapt while we go. We are already living in a changed climate, and we need to prepare for much further change. What we can't do anymore is sit on our hands and wait for a better solution – one which costs less or doesn't inconvenience so many people. If we don't make the hard choices that we need to now, the climate will make them for us.

Giorgio Parisi: I would say in a nutshell that the cure is clear: we should reduce the greenhouse effect. We should reforest. This can be done either by the exploitation of renewable energies, energy saving and the reduction of some consumption, like meat, as was stressed before, which would, in some sense, go together with the improving of our health; because in many, many countries, like Italy, we do eat too much meat.

Generally speaking, I would say that we are facing a huge problem that needs decisive interventions, not only in this direction, to stop the emission of greenhouse gases, but also in scientific investment. We must be able to develop new technologies to conserve energy by transforming solar energy or other kinds of energy into fuels; we should have non-polluting technology based on renewable resources. Not only must we save ourselves from the greenhouse effect, but we must also avoid falling into the terrible trap of exhausting our natural resources. Energy saving is also an issue that should be tackled in a decisive way. And we should somehow stop using too much heating in the winter and too much cooling in the summer.

We have to block climate change in a successful way, and the price incidentally connected to this will engage humanity for many, many years. It will require a monstrous effort by all people. It's an operation with a colossal cost, both financial and social, with changes that will affect our lives. The political powers must

ensure that these costs are accepted by all, and that those who have used the most resources must contribute more in order to affect the bulk of the population as little as possible. The cost must be distributed fairly and equably among all countries, and the countries that currently use the most resources must make the greatest effort.

Wolfango Plastino: *Is the destruction of mankind and our planet likely, or just science fiction?*

Petteri Taalas: We have to keep in mind that we are not fore-seeing the end of the world, neither for human beings nor for the biosphere. But the higher the warming rate is going to be, the more negative impacts we will see and the more difficult it will be for us as human beings. It will also be more difficult for the biosphere.

We need to keep in mind that the media sometimes likes horror stories, and we may have got the impression that we have this kind of apocalyptic view of the future. The scientific proof based on these climate models doesn't show that. But it has clearly shown that the lower the warming rate, the better things will be for the welfare of mankind, and with these higher numbers we will see lots of unrest globally. That will be the source of various crises. For example, one reason behind the so-called Arab Spring, which led to changes of the government in Tunisia, Libya, Egypt and the still ongoing war in Syria, was severe warming, which dou-bled food prices, and led to the unemployment of the agricultural population. That kind of crisis will become more frequent unless we are able to limit the warming to safe numbers.

John Shine: Well, the planet will survive, and humanity will undoubtedly continue. But the threat to a stable worldwide civi-lization is very real. Imagine if severe climate disturbances meant that we could no longer maintain uninterrupted international communications, or we couldn't get the water to irrigate stable crops, or we couldn't distribute those crops due to damaged trans-port infrastructure.

The social impacts of extreme weather events are well known. These have been enormously costly, in terms of both people and infrastructure. As they escalate, it will become harder and harder to keep people safe and secure. Governments cannot afford to ignore science. They must invest in the technology, policy and actions that will address the causes. The changes needed are enormous, and of

course, if we'd started forty years ago, we'd be forty years ahead now; that didn't happen. But the good news is, we have the science and we have the technology. We have the knowledge. We do know what we need to do, and we do know we need to do it now.

Giorgio Parisi: I think that our planet is extremely resistant. We have seen a lot of much more difficult periods, and the mass extinction of species has happened in the past many, many times. I think that the problem is ours; we should avoid ending up like the dinosaurs.

Now, I think, as has been mentioned, that the greatest danger is that climate change may cause very strong international tensions. It's clear that a billion climate migrants are not manageable. If we have to relocate billions of people, that cannot happen in a peaceful way. And now nuclear war is a much greater danger than climate change, but the effects of climate change may trigger nuclear war if the situation or relations among states become more and more strained.

I also have to mention that there might be the danger of falling into a Catch-22. We need to combine the actions of all countries of the world to combat climate change, and this may not happen if climate change itself has just created very strong tensions between nations. So, for this reason, it is extremely important to act as fast as possible, before this political increase of tensions between countries becomes too frequent.

It's clear what I'm thinking of. If we have a drought problem, a lack of rain in India and other regions, and we have to relocate people from India, one of the most populous countries, into the Northern hemisphere, as for instance into Siberia and Canada, this cannot be easily done, and therefore it would be a problem. We have seen what happens when there are tens of millions of migrants; it's clear that when there are billions, it won't be possible to take them in. So we should act now.

Global Security and Disarmament Agenda at Crossroads

A Fragmented World or a Cohesive Future?

Carlo Lo Cascio
Izumi Nakamitsu
Marie-Louise Nosch
Giorgio Parisi
and Wolfango Plastino

Introduction
Carlo Lo Cascio

The international security architecture is undergoing a pivotal challenge these days – one that puts a strain on the values of the liberal systems we have preserved and promoted so far, and questions the resilience of the world order in the near future.

The unexpected scenario that unfolded in the aftermath of the unprovoked and unjustified aggression against Ukraine compels us to adapt our thinking to the new circumstances, and renew, if not redouble, our efforts.

This is a multi-faceted crisis, as the aggression against Ukraine has brought key security and disarmament issues to the fore. We have read credible reports of extensive, indiscriminate use of explosive weapons and cluster munitions in populated areas, resulting in a huge number of civilian deaths and casualties, key infrastructure damaged, and human rights infringed.

We see the concrete risk that the prosecution of this war can pose to non-proliferation. First, we must uphold the viability of the multilateral architecture built on the Treaty on the Non-Proliferation of Nuclear Weapons we firmly believe that the road to a cohesive future within the global security and disarmament architecture passes through the full-scale implementation of this cornerstone Treaty, along with its three mutually reinforcing pillars. We see in a constructive outcome of the Tenth Review Conference of the Parties in August 2022 an unmissable chance to sustain and advance global efforts to counter Weapons of Mass Destruction (WMDs) proliferation.

Furthermore, the ongoing talks on the Joint Comprehensive Plan of Action (JCPOA) track, as well as the increased missile activities by the Democratic People's Republic of Korea (DPRK), mark a very delicate time in the global non-proliferation agenda. Italy is well aware of Tehran's possible role in addressing the manifold regional challenges, but in parallel deems it crucial to offset Iran's worrying nuclear trajectory, while ensuring full-scale and transparent cooperation with the International Atomic Energy Agency (IAEA).

We also express deep concern that Pyongyang has ramped up its weapons testing activities, with a repeated series of missile launches since the beginning of 2022, and stand united with our partners in calling for a constructive engagement of the DPRK towards a complete, verifiable, and irreversible disarmament.

The Lincei have a longstanding tradition of promoting and defending science diplomacy, and indeed, we believe that a renewed synergy between science, technology and foreign affairs can lead to advances also in the fields of disarmament and non-proliferation.

Let me remind you, for instance, that at the end of this year, Italy will chair the Ninth Review Conference of the Biological Weapons Convention, which is the first multilateral treaty to ban an entire category of WMDs. Since its entry into force in 1975, the Convention has been grounded on science-based evidence, development of technical capacities, and multilevel and multisector cooperation. By encouraging the peaceful uses of biological science and technology and by enhancing our preparedness for disease outbreaks, this Convention is an example of how far this synergy can take us toward a cohesive future.

Similarly, new challenges are emerging in the field of autonomous weapons, whose responsible use in compliance with International Humanitarian Law can significantly take advantage of research activities at the intersection of security and technology.

If the global security and disarmament architecture stands at a crossroads, then we must place greater trust in multilateralism – an inclusive and effective multilateralism, aimed at engaging all relevant actors and delivering tangible results. We must be able to strengthen the international non-proliferation regime; to ensure an early entry into force of the Comprehensive Nuclear-Test-Ban Treaty; to call for the early commencement of negotiations on a treaty banning the production of fissile materials; and to work constructively toward consensus at the incoming Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons. We must encourage the broad and active participation of civil society in multilateral processes. It is a re-engagement in, and not a disengagement from, multilateral fora that can give momentum to the global security and disarmament agenda. Italy is ready to play its part.

Maybe it is right here, at a crossroads, that we can forge a more cohesive future.

Lectio Magistralis
Izumi Nakamitsu

When Russia invaded Ukraine on February 24, 2022, the world witnessed an act that undermined international peace and security, with negative reverberations felt across the globe and on many sectors. The war claimed a terrible human toll: thousands of lives have been lost, millions have been displaced and the destruction has been devastating. Today, 15.7 million people in Ukraine are in urgent need of protection and humanitarian assistance – and we know these numbers will only continue to rise as the war rages on.

And it is not only the people in Ukraine who are affected, although they are of course the most directly impacted. A three-dimensional global crisis affecting food security, energy and finance is threatening the world's most vulnerable people. Food prices are at near-record highs, while fertilizer and oil prices have doubled. Tens of millions of people could be pushed into a crisis that could last for years. With the latest World Bank predication that weak growth and rising prices could lead to further economic stagnation and inflation, we are looking at a toxic combination that will hit particularly hard in developing countries. As a result, economic inequalities are deepening, exacerbating trends of social and political insecurity. We have already seen the rising cost of food spark protests.

In tandem with the challenges of recovery from the Covid-19 pandemic and emerging threats such as climate change, these developments mean that our rules-based international order is facing an inflection point and that the Sustainable Development Goals are slipping out of reach.

The actions of Members of the UN Security Council have highlighted the Council's limitations to effectively deal with such threats to peace, and have further exposed growing divisions. Taken together, we find ourselves at a crossroads for international peace and security, one which Secretary-General António Guterres defines as a "make or break moment".

Though the outlook remains grim, I am not here to give the message that we are helpless. As the United Nations, we are not

shying away from these dire circumstances – in fact, the opposite. I would like to use my address today to talk about three things: what the UN is doing in and for Ukraine; what the UN is doing to mitigate the impact of Ukraine at the global level; and finally, how we can reinvigorate disarmament and arms control efforts as a means to support the restoration of a rules-based international order.

First, from the early days of the war, the UN has supported the people of Ukraine to deal with the humanitarian impact of the conflict, while drawing global attention to the long-term risks of continued fighting and escalation, both for the region and the world.

The entire UN system has mobilized in response to the crisis, to support the people of Ukraine. There are more than 1,300 UN staff working inside Ukraine, operating out of 8 hubs. Our humanitarian and development agencies are providing critical assistance and basic services to Ukrainians, even in the hardest-to-reach areas of the country, while the High Commissioner for Human Rights is working to document and report on the brutal violations of human rights that have taken place. The UN Development Programme is working with government authorities to address the contamination of vast swathes of Ukraine with unexploded ordnance. The International Atomic Energy Agency (IAEA) has been relentless in its endeavors to ensure the safety and security of Ukraine's nuclear facilities to make sure that the people who suffered through the catastrophe of Chernobyl do not have to do so again. The potential consequences are stark: any safety risk of nuclear power plants in Ukraine could endanger the security of the entire continent.

In the meantime, the UN has repeatedly called for an urgent ceasefire to protect civilians and to facilitate a political dialogue to reach a solution. During his trip to Ukraine and Russia, the UN Secretary-General proposed the establishment of a Humanitarian Contact Group, bringing together the Russian Federation, Ukraine and the UN to look for opportunities to open safe corridors, with local cessation of hostilities, working with the International Committee of the Red Cross (ICRC). These efforts proved fruitful with the evacuation of hundreds of civilians from Mariupol, and efforts continue.

As I mentioned, the consequences of the war in Ukraine are far-reaching and pose a humanitarian crisis for populations around the world. In response, the UN is working on a strategy to support millions of people. The Secretary-General's announcement of a Global Crisis Response Group on Food, Energy and

Finance is intended to address the broader impact of the war.[1] We are on the brink of the most severe global cost-of-living crisis in a generation. The Response Group's latest report demonstrates the interconnected nature of the three dimensions of the crisis: food, energy, and finance. It emphasizes that tackling just one aspect will not solve the global crisis we are in. We should avoid a cycle of social unrest that might lead to political instability as a result of the weakened ability of countries, communities and families to cope with yet another global crisis, on top of Covid-19 and the climate crisis. We must formulate coherent approaches to these global challenges, devise concrete and actionable solutions, and build partnerships that rely on data and analysis.

In addition to the things we can see, let me also say that there are intense but confidential and behind-the-scene negotiations led by the UN regarding the possibility of releasing to the world market wheat and other food commodities from Ukraine despite the war, and fertilizer from Russia and Belarus despite the sanctions. The United Nations also recognizes that good-faith negotiations and dialogue are the only way to resolve this crisis.

I now come to my third area of today's talk, related to my direct area of responsibilities in disarmament and international security. What we are witnessing today in Ukraine is not only a serious challenge to the international order, but also the culmination of a decade-long trend of increased polarization among "great" powers, a decline of trust within and among nations, and the withering away of multilateralism. These have already been placing extreme stress on our multilateral peace and security architecture. The world is a less peaceful place today even compared to a decade ago.

We have seen these trends in disarmament and arms control and have seen them accelerate, in part because of this war. According to a recent report by the Stockholm International Peace Research Institute (SIPRI), global military expenditures continued to increase in 2021 and surpassed 2 trillion US dollars for the first time in history, in spite of the Secretary-General's call – at the start of the Covid-19 pandemic – for the opposite to occur. We have seen the repeated violation of the taboo against chemical weapon use and the use of increasingly heavy and sophisticated weapons against urban populations. But there are two issues specifically I want to raise, given their recent prominence with respect to Ukraine: nuclear weapons and cyberspace.

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[1] Global Crisis Response Group on Food, Energy and Finance, https://news.un.org/pages/global-crisis-response-group/.

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The actions and rhetoric in Ukraine have laid bare the prominence of threats we thought we had closed the door on more than thirty years ago, including the threat of nuclear weapon use in war. This is coupled with the trends we've seen over the last decade: a shift to a multipolar nuclear order; growing competition between nuclear-armed states combined with declining levels of dialogue and transparency; a return to prominence of nuclear weapons; regional crises with nuclear overtones; and the emergence of new weapons and technologies that may lower the barriers to nuclear weapons being used.

Ukraine has exemplified two major problems with nuclear deterrence: first, that nuclear weapons do not prevent war, but instead enable possessors to act with impunity while raising the risk of catastrophe; and second, the circulation of an inaccurate narrative that if Ukraine had kept the Soviet weapons stationed on its territory, it would have deterred invasion. This is a longstanding, but false and dangerous, message for non-proliferation. Equally false is the idea that nuclear disarmament and security are incompatible – to the contrary, decades of arms control successes have proven that disarmament measures have boosted both national and collective security. When it comes to the existential threat of nuclear weapons, we need to take urgent action and step back from the brink before such a weapon is used, either intentionally, by accident or through miscalculation. The catastrophe of the use of nuclear weapons could not be justified by any rationale.

In addition to nuclear risks, we are contending with the opportunities and risks of new and emerging technologies within this fraught geopolitical environment. Cyber-related risks, tensions and competition are undermining the shared character of the digital space. Over the last decades, the malicious use of Information and Communications Technologies (ICTs) has dramatically increased in scale, scope and severity by both state and non-state actors.

In connection with the current conflict in Ukraine, we are witnessing widespread distributed denial-of-service incidents and destructive malware attacks alongside the mobilization of cyber defenses. The risk of rapid and uncontrolled escalation is increasing and the fear of conflict spillover into the digital space is real.

Of specific concern is malicious ICT activity affecting critical infrastructure, such as that providing essential services to the public like health sector entities. The Secretary-General has drawn specific attention to cyberattacks on healthcare facilities during the pandemic, calling on the international community to do more to prevent and end these activities causing further harm to civilians.

Clearly, there is no dearth of risks that we face. But we should not forget the opportunities that we can capitalize on and the tools we can better utilize. The Tenth Review Conference of Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, better known as the NPT, is one such venue, where we can call on all states to reaffirm their commitments to the norm against the use of nuclear weapons and to the goal of a world free of nuclear weapons, as well as the norms against proliferation and testing. Progress in the elimination of nuclear weapons is in everyone's best interest, and while the nuclear-weapon states must lead, it is the responsibility of all states.

We at the United Nations recognize the changing geostrategic context and understand that we must adapt the international system, and our responses to it, accordingly. With this in mind, in 2021 Secretary-General António Guterres announced his intention to deliver a New Agenda for Peace with disarmament at the core. This will require, among other things, an updated vision for disarmament – one that takes into account, and has the flexibility to adapt to, a rapidly evolving international context. It should seek to guarantee human, national and collective security, including through stronger commitments to the non-use of nuclear weapons and a timeframe for their elimination, the regulation of new weapons of technology, commitments to reduce excessive military budgets and ensure adequate social spending, tailored development assistance to address the root causes of conflict and uphold human rights, and a stronger link between disarmament and development opportunities. It should help us move away from the reliance on weapons and towards an investment in diplomacy and dialogue.

Through this new vision, we must reinvest in the unfinished business of disarmament, such as the entry into force of the Comprehensive Nuclear-Test-Ban Treaty, the adoption of a Middle East Zone free of WMDs, and the negotiation of a treaty prohibiting fissile material for nuclear weapons. We can also build guardrails for the ungoverned spaces of nuclear weapons – missile defense, non-strategic nuclear weapons, and delivery vehicles, especially missiles – while examining the potential new risks and vulnerabilities in cyberspace and outer space. And we can address the danger that cyberspace is becoming a new domain of conflict. This is a serious concern. To this end, there are two priority issues that deserve particular attention and that I hope will be taken up in support of the New Agenda for Peace.

The first is ensuring the protection of critical infrastructure, including in the healthcare sector. In the context of the Covid-19 pandemic, the Secretary-General has called for stronger protections of

the healthcare sector from malicious cyber incidents. Further work is needed on identifying what constitutes critical infrastructure. Consideration should also be given to specific measures to protect critical infrastructure, including through enhanced common understanding of the applicability of international law to protect civilians from cyber operations undertaken in the context of armed conflict.

Second, there is a continuing need for a permanent platform to support capacity-building and the practical implementation of the existing normative framework in the cyber context. Such a platform could serve as a hub for national reporting, peer-to-peer reviews, matching needs with resources and coordination among national points of contact. These practical efforts would go a long way in supporting a reduction of cyber-related risks and tensions through greater transparency and accountability.

The conflict in Ukraine is a critical reminder of why we need disarmament, arms control, and non-proliferation. These are not abstract utopian concepts. They are instruments for security – human, national and collective security. And they are essential to conflict prevention, mitigation and resolution. Without disarmament, arms control, and non-proliferation, we cannot hope to prevent the use of inhumane weapons, reduce the risk of nuclear conflict, or protect civilians from harm. By shifting our resources from arms to social investment, we can also help stave off the worst of the global economic and social crisis.

As I mentioned at the start of my remarks, we are at a crossroads. If we do not act, the fabric that has held together international peace and security will fray beyond repair. We will see more arms races, more spending on weapons and conflict, more poverty and inequality, less investment in peace and development, and more human suffering. The world will descend into further fragmentation.

However, if we course-correct and bring Member States and all major stakeholders together, we can trigger urgent action to prevent and mitigate conflicts, leading us to a more peaceful and prosperous future. But the United Nations cannot do this on its own. We need dedicated support from all Member States and the involvement of civil society, academia, and industry. This would help build the strong and networked multilateral system that can uphold universal values and address the dramatic challenges we face that we so desperately need.

Pulling together for a cohesive future will not be easy, but it will be worth it. I hope you will join me in that effort.

Discussion *

Izumi Nakamitsu, Marie-Louise Nosch, Giorgio Parisi and Wolfango Plastino

Wolfango Plastino: *Does the international community have the right tools to address the current challenges posed by nuclear weapons? How has the war in Ukraine affected prospects for nuclear disarmament?*

Izumi Nakamitsu: I think, as I mentioned, that so many things have changed in our world, so business as usual is no longer possible. I think we need to collectively come out with a new approach and new vision that is based on science, data, evidence, but also on the flexibility of our minds, if you will. We also need to look at the intersection of various weapon systems. It's no longer just nuclear weapons that pose a threat to us, but this is also combined now with capabilities in outer space, the cyber domain, etc. So, we definitely do need new approaches and a new vision.

Crafting a new vision in this kind of a close-to-impossible environment is difficult, but I think we need to make sure we have a really serious and substantive conversation about what it is that we need to actually do, and what might be the new approach, which is not a traditional approach to disarmament – amounting to just looking at the categories of weapons and the arsenals, counting the numbers of nuclear arsenals – but something that will also weigh the intersections of various weapon systems, something that will also assess not just military capabilities in weapons, but also responsible behaviour.

So, these are some of the ideas that we will be developing, as I said, in the context of a new agenda for peace. We want to discuss these issues, and then come out with a new vision for disarmament,

which will then be included in a New Agenda for Peace from the Secretary-General.

Marie-Louise Nosch: I have to say first that I am humbled to be in the presence of the amount of expertise that we have here.

You are asking for new approaches, and also science-based approaches, and I think this shows very clearly the relevance of our being right here, in the Accademia dei Lincei. I will speak as president of the Danish Academy of Sciences. I believe that our academies have a new role to play in the current situation: the role of trying to find new approaches and perhaps even solutions. We are often considered old-fashioned, but it appears that, given the terrible refugee situation, the academies have been a place where refugee scholars have sought to rally and to find shelter. Especially in Warsaw, in Poland, where I visited last week, many Ukrainian scholars have now found host institutions where they can continue their work. And with the presidents of the Academy of Sciences of the United States, the UK, Germany, Ukraine and Poland, we've signed a ten-point action plan to help Ukrainian scientists. Madame Izumi Nakamitsu spoke of inflation, and I believe we can say that the opposite of inflation would be education and research. And one of the new approaches would be to invest very much in education and research for the future.

So, the complex question that you're posing is whether we have the right tools to address the current challenges posed by nuclear weapons, and how the war in Ukraine has affected the prospect for nuclear disarmament. I have started to study this situation with the help of my colleagues in international law and history, and I find what is going to happen in Vienna in the next days[2] to be very interesting. You spoke about the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), and the NPT was founded the same year I was born, so it's already old, and was perhaps very shaped by the Cold War. Now we have a new initiative, and speaking in the metaphor of security architecture, I would be very curious to see whether the new Treaty on the Prohibition of Nuclear Weapons will be a roof, or an additional building? And how can the two treaties actually work together? They both have something interesting to offer, I believe. With all the developments that we have in the nuclear area, both for dual-use,

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[2] Ms. Nakamitsu refers to the first meeting of State parties to the Treaty on the prohibition of nuclear weapons, which took place in Vienna from 21 to 23 June 2022.

also for nuclear energy, I believe we need to put security first, and therefore this architecture will be crucial.

I would also like to add, in terms of tools, that we see clearly that this war is also a media war, a war fought on the media platforms; and again science and science-based information becomes crucial to fight the fake news that we see spreading. I believe that the sciences and education again offer an approach that we need to use more. It's not a new approach, but we need to use it more.

Giorgio Parisi: I think that there are two things that have to be done. The first one is to try to conclude the existing treaties; and then we need treaties written with a different time in mind.

For example, consider the NPT. The NPT was signed nearly sixty years ago, and it was an extremely important treaty, because it committed the non-nuclear states to stop building nuclear bombs. However, this was expressed in an imperfect way; even though without the treaty, we might have twenty, thirty states with atomic bombs, which could bring us to the brink of a complete disaster, yet also in that document, the nuclear powers committed themselves, in good faith, to the complete elimination of the nuclear weapons in their possession. But in these fifty years, I do not see any good-faith talk internationally of the complete elimination of nuclear arms. So this promise has not been fulfilled, and I think that we should insist that the treaty be completely valid.

The other problem, for which I think we need a new treaty, is the problem of the first-use policy concerning nuclear weapons. China and India have formally declared that their policy is to not be the first to use nuclear weapons, but France, Pakistan, Russia and the United States certainly have never declared that they will not be the first to use nuclear weapons; indeed, they have explained they will engage in first use if the circumstances push in that direction. So I am not comfortable with this situation, and I would be happier in the present crisis if Russia and the United States and other countries had made a no-first-use statement.

It's clear that the Ukraine crisis does not help. Unfortunately, we know that when there is a crisis, things do not go well. For example, the SALT-II Treaty was signed in 1979, but it was never ratified because of the war in Afghanistan. I suggest that this is bad news, because at that moment when the tension increases, you most need to establish the treaty, but the strings attached to the political situation make the establishment of the treaty much more difficult.

Wolfango Plastino: *Given the importance of considering the impact of present-day decisions on future generations, as the UN Secretary-General has repeatedly emphasized, what is the best way to create awareness among diverse groups of young people across the globe to learn about and engage in disarmament?*

Izumi Nakamitsu: Thank you for that question; I think you know how passionate I am about working with young people.

In 2018, Secretary-General António Guterres called young people the ultimate force for change; he really believes in that, and I believe in it. When the Secretary-General launched his disarmament agenda – and, by the way, this is the first UN Secretary-General to have ever come up with a comprehensive agenda for disarmament, which he launched in 2018[3] – we were talking about where to launch this comprehensive agenda. And he said to me: "Izumi, if we are really serious about disarmament, then we have to speak to young people. I don't want to launch this agenda in a UN conference room; I want to speak to young people". So I had to look for a university, and I found one in Geneva. That's where he launched his agenda.

This is how we are really looking to young people. We don't say this just because youth engagement is nowadays *à la mode*, and we don't say it just to check the box. We really mean it. It's not just that we listen to them, that we give platforms for them to talk and engage, I think we have to also help them acquire the skills and knowledge that they need in order to think about how best they could pursue this objective of disarmament.

This is actually one of the priority areas of our work at the UN; we now also have a UN General Assembly resolution that was adopted by consensus on youth engagement in disarmament work. So this issue has been highlighted.

Now, what do we do? This is one of our priority areas, and we have many initiatives, but just to name one example: we choose young people of basically up to 22 years old, and these are really younger people, students, whose disarmament interests differ, depending on where they come from. Some young people are really focused on nuclear issues, like those who are from Hiroshima and Nagasaki, for example. Our African youth fellows are much more interested in small arms and light weapons, because those are the

[3] United Nations, *Securing our Common Future. An Agenda for Disarmament* (https://www.un.org/disarmament/sg-agenda/en/).

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weapons that are killing people on a daily basis in many of those areas and countries which are still suffering from conflict. So we bring together different, diverse backgrounds of young people, create a platform and then have a sustainable engagement throughout the year. For parts of it, they have to do online education efforts; they have to learn detailed knowledge about the subject. We provide a platform for them to meet up together; they exchange their respective experiences, and then we also give them opportunities to experience how United Nations multilateral disarmament negotiations are being done. They also have opportunities to visit places like Hiroshima.

This is just one example. We base this work on something called the Disarmament Fellowship, which is essentially a training course for young diplomats, who are actually the ones who will be negotiating these disarmament treaties, and these training courses have really helped them develop, not just their knowledge base, but, if you will, camaraderie, across borders; these are people who understand each other's positions, where they are coming from in terms of their national positions, and who then find the way to discuss these positions and to find common ground.

These are just very few examples, but all this is to say that we need, not just to listen to young people, but to empower them; they have to think for themselves what will be the best way to pursue nuclear disarmament and other areas of disarmament efforts. Then let them take the lead as well. They come up with really creative perspectives that I would have never come up with; so we need to increasingly listen to them and empower them and let them take the lead.

Marie-Louise Nosch: Well, Professor Plastino, my first reaction to your question was, "This is typical: we want to engage the young people and create awareness of the problem. Is this once again us old people asking young people to solve the problems that we were not able to? Why don't we just solve them, rather than asking the young to do it?".

That was my first reaction. But of course you're right. And I recall this excellent piece in *The Guardian* by the historian Daniel Immerwahr[4], who writes about the fact that, of course, those who

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[4] D. Immerwahr, *Forgetting the apocalypse: why our nuclear fears faded – and why that's dangerous*, *The Guardian*, 12 May 2022 (https://www.theguardian.com/world/2022/may/12/forgetting-the-apocalypse-why-our-nuclear-fears-faded-and-why-thats-dangerous).

remember Hiroshima and Nagasaki are no longer with us; and we are the old generation. We remember images of the nuclear bomb tests; but the young people don't remember this anymore, so there's a kind of lack of awareness, and, as he says, we would probably need to create a kind of nuclear literacy about what the dangers of all this are, and how it relates to environment and also climate change.

So, you are right that this is important. By engaging with young people, we can respond to the Undersecretary-General's demand for new approaches, because I believe that young people can bring new approaches. And again we need to integrate this engagement in science and education: the Cold War and nuclear weapons have become a topic for history, and that's wonderful, but it should also be something that can be discussed as a current issue, and not just as a historical fact. I believe this, especially if we let the young people take the lead on how to address these things, because clearly we have not been able to find the solutions.

Giorgio Parisi: I think the most important thing regarding young people is school. School should teach a lot of things. However, the point is that, quite often, teachers do not know very much about nuclear weapons, and they also do not have any easy written texts which they can use in their courses. So I think it is very important – coming to our duties as academics – to prepare something in this direction, to prepare teachers in schools, to reflect on what should be taught to the students.

There are many, many points to touch on. For example, people do not know exactly what the consequences of a nuclear war would be, what the consequences of a localized war would be, what the consequences of a war that tried to strike only military objectives would be, or a war that really tried to inflict the maximum damage. People also don't realize that what we might call, for example, a limited nuclear war between India and Pakistan, apart from the tens or hundreds of millions of dead locally that this would entail, would also have a good chance of producing global consequences for climate, in a nuclear winter. This should be general knowledge.

I think, however, that the most important thing is to tell the story of the many nuclear treaties surrounding control and reduction, because one should understand that we have a sequence of treaties that have also been studied academically; the scientists are pushing in this direction. And these treaties form some kind of network or umbrella that protects us. We should also tell them how, during the Cold War, people agreed on nuclear armament

reduction treaties – the SALT, the START, the new START, the treaty on the decrease of intermediate-range missiles. We have to make clear that there was a season of treaties. And if we do not see any new seasons of treaties – sometimes we actually see them going backward, not going forward – this does not mean that we cannot start again. We have to pass on to our young the hope of a new season of treaties, which will go in the right direction.

Wolfango Plastino: *What are the ongoing efforts in addressing emerging technology challenges? Does current arms control architecture fit for today's emerging technology challenges? Is there hope for multilateralism in these areas?*

Izumi Nakamitsu: I already mentioned some desirable areas for multilateralism. In fact, there are a few different processes, a few different areas of technology, for which multilateral discussions are already taking place. In the case of cyberspace, this has already been happening for some two decades; and recently, we have made some really good progress.

Now, if people say that it's the wild west, and there's no norm in cyberspace, this is not really accurate. The UN Charter applies to cyberspace; international law applies; international humanitarian law applies. Those issues have been actually confirmed by the entire membership of the United Nations. So it's not that we don't have any norms. The General Assembly has also agreed, by consensus – that means everyone has agreed – on the voluntary norm of responsible behaviour of states. What we need to focus on now is to make sure that those norms will actually get implemented. There is an open-ended working group of the General Assembly tackling those issues.

Our next priority is to make sure that there will be an implementation framework, or, if you will, an action plan, that will be developed and agreed upon. We also need to make sure that all states have the capacity to implement those norms. There isn't a level playing field. It's a question of understanding that the capacities of different countries are very different. So we need to make sure that these capacities are also built. And as I mentioned, two top priorities are that we come out with a very strong norm to counter cyber operations against critical infrastructure, and also that we protect civilians.

For artificial intelligence (AI), lethal autonomous weapon systems – I'm sure you've heard this – there is also an ongoing multilateral discussion. I was in Geneva, and I had some good discussions

with the current chair of that group of governmental experts, the Brazilian ambassador Flávio Soares Damico; and here again there are voluntary principles which have emerged and which have been agreed upon. If you actually look at those, it's quite good behaviour and norms that have been agreed upon.

The next phase is this: to keep to the area of AI, the critical issue is how human control is to be retained. The Secretary-General said that the very idea of a machine making a decision to take human life without human intervention, human control – that idea itself is repugnant and has to be banned. And so to that extent, the international community has agreed. The next phase is seeing exactly how we are going to translate this agreement into an operational and actionable framework. There are some interesting developments that are taking place in that multilateral discussion in Geneva.

Similar discussions have also recently started regarding the responsible behaviour of states in outer space. I am not going to go into too many of the details, because I've spoken so much already, but interestingly, despite the current context of direct confrontations between big powers, the professionals and the experts participating in these discussions so far have been able to discuss very professionally the substance of this matter. Things get really complicated when politics enters the equation, but so far on the substantive issues there have been some interesting discussions. I hope that these processes will also actually become a concrete input into the Secretary-General's future summit, which he would like to organize in 2023, demonstrating through all these things that multilateral platforms are important.

The problem with multilateral platforms is that science and technology develop and move forward so rapidly, and multilateral diplomacy takes time, so we need to do a lot of catching up. We have to accelerate and speed up, and that's where I think people like yourselves – scholars, the scientific community, civil society – can really push governments.

Marie-Louise Nosch: I think it's very interesting to see what is developing with emerging technologies, and as you said, the technologies are moving much faster than the frameworks, including the legal frameworks. As a historian, I have to reveal my sources, so I have to say that this is something that I discuss very much with my daughter and her friends who study law. I believe that there is already, as you said, a very robust framework that can capture some of these new developments. In international law,

there is of course a strong focus on casualties and physical damage, whereas we live in a digital world, and things change in other ways. It's of course punishable to bomb a post office, but to destroy the social media where people exchange information somewhat evades the rules of war.

So I think there is still some catching up to do, and I can see that this is of great interest to young lawyers, who follow this question closely.

Giorgio Parisi: I think that one of the big problems is that many of the existing treaties were made in a bipolar world, and now the world is no longer bipolar, especially as far as nuclear armament is concerned. One of the sad cases was that of the Intermediate-Range Nuclear Forces Treaty; this was a treaty made between the United States and the Soviet Union, and later on automatically with Russia, that banned all land-based missiles with a range between 500 and 5,500 kilometres. This treaty was signed in 1987, but the treaty was renounced by the Trump administration in 2019, both because of some suspicions that the Russians had violated the treaty – I don't want to enter into the question of whether these suspicions were correct or not – and also because there was much concern about the development by the Chinese of inter-mediate-range missiles.

So, it's clear that it would not make sense to go on with this treaty as it stands – it has already been renounced – but we need a new treaty involving at least India, China, Pakistan, and – why not? – France and the United Kingdom. I think that is important, something that we really need. While we have the new START, the added treaty that puts boundaries on our strategic weapons, the only treaty on intermediate-range, is this one. But this cannot be done anymore in a bipolar world.

Wolfango Plastino: *What is the relationship, in your view, between the disarmament agenda and sustainable global development?*

Izumi Nakamitsu: This is actually an old idea. The UN Charter talks about the maintenance of international peace and security with, and I quote, "The least diversion for armaments of the world's human and economic resources". So when the UN was made, they obviously thought about how we should not only be investing in military, but how to make sure that there will be so-cial and economic development.

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Now more recently – fast-forward many years – in Sustainable Development Goal 16.4 we are directly mandated tasks to tackle the issue of the illicit arms trade, for example. So this has always been part of development thinking, development approaches. The reason for this is actually quite easy to see: stable, more peaceful societies in the world are the precondition for development efforts. You can come quite naturally to this conclusion: small arms and light weapons are enablers, not just of conflict, but also of gender violence and criminal activities around the world. All these challenges actually get in the way of us trying to work on sustainable development.

So I think what we need to do is to make sure that quite basic thinking is really understood by everyone. I actually worked in the development field also, in the United Nations Development Programme (UNDP); my responsibility was still related to crisis response, both in terms of natural crises like earthquakes, etc., but also conflict-related crises. We saw in our development that making sure that societies are stable through these disarmament measures and the more effective use of the instruments at our disposal would greatly benefit development efforts. The key again is to translate those principles into actionable instruments and tools, and from the UN we are trying to make that more visible. If those great agreements, the norms that the UN conferences in New York or Geneva will agree upon, can be brought down to the field-level and country-level efforts for peace-building and for sustaining peace efforts, then I think at that point we are really talking, and we will begin to see much greater impact.

So we are trying to do this, but the reality is that the communities of professionals are very siloed. Disarmament people usually look at disarmament issues, humanitarian people usually look at humanitarian issues, development people usually look at development issues; even the vocabularies are different. I had to learn all these, because I moved from humanitarian to development to peacekeeping, and now to disarmament. Every time I moved across these different communities, I had to learn everything from zero. It's not easy, but I think we have to make that kind of effort.

Marie-Louise Nosch: I think it's important that we have 17 sustainable development goals, and that they are not, and should not be, siloed. They should be interconnected, and not just number 17 in partnership, but all of them. And of course number 16 is about peace and justice, where disarmament belongs. But I would like to highlight this also: I believe it is also interwoven with num-

ber 7, on clean energy, and what we see today with the green transition offers much hope for using nuclear energy as part of this transition. This can be a difficult road to walk because there can be so much enthusiasm about it that we tend to not have literacy about the dangers and problems that are still present, despite all the new promising ideas about clean energy. From a science perspective, I believe it is very important for us not to be naive. Of course, investment in nuclear energy will also have spill-over and dual use with nuclear weapons and vice versa. So the massive investments that we might see with a green transition toward a cleaner energy – for example, nuclear energy – could also have ramifications for armaments. And again, I think that before we invest in this area, where there might also be ramifications for other, more dangerous fields, we need to have a security framework around it, as well as control, to ensure that the investments are used for the right purpose and can be monitored and controlled according to the treaties that are in place, and maybe also those that should be in place.

These are the issues I would strongly raise about the spill-over effect, positive and negative, that might come of this renewed interest in an area that has been perhaps sometimes overpromising and underperforming; but we hope that it will give better results, especially if third- or fourth-generation reactors can use waste from third-generation, and that there will be fewer problems in this area.

Giorgio Parisi: I think that there is one problem here, which has a strong connection to others, because stopping climate change is an undertaking that will engage humanity for a long, long time; it will require some monstrous efforts, and it will have a colossal cost, not only financial, but also social, as some of the required measures will affect our existence. And it's clear that this creates a problem for the governments, which must make sure that these costs are accepted by all. But it is not easy to bring rich and poor people together, to bring together people with such different interests in everyday life, and I believe that inequalities – inequalities within a country, and inequalities among countries – are the most serious obstacles to achieving a successful level of stopping climate change.

Now, it is clear that stopping climate change, if it should be successful, must be addressed from a fair and solidarity-based perspective; but I don't see how this can be accomplished in a world that is ridden with the nightmare of wars. If you don't have peace, not only do you not have all the consequences of peace, but

everything becomes difficult; it's clear that it will be very difficult for nations that are in a state of war, cold or hot, to agree on operations for global climate control. For this reason, it is extremely important to achieve disarmament, because disarmament introduces less need of war, less chance of war, since disarmament is going to protect peace.

Also, by cutting military expenses we should also produce one side effect, but a very important side effect, of disarmament: we will free up so many resources that can be used in other directions, because also the financial capacity of different countries is not infinite, but is bounded, and what is used for military purposes is not used for other projects, like enacting clean energy and so on.

Wolfango Plastino: *How do new developments in the area of conventional weapons impact the disarmament and arms control in this regard?*

Izumi Nakamitsu: This is a very important question for many people, many countries. Developments like 3D printing, material science, modular design – those types of new technologies – will definitely make our disarmament efforts in the conventional weapons area much more challenging. Here again, I think we need new thinking. Our effort was always finding ways to trace these weapons, to prevent their illicit trade, but with the 3D-printing technologies, there are new challenges which a traditional approach will actually not be able to tackle. So we definitely need new thinking on how to tackle those challenges.

But of course, like any other areas, those technologies will also be beneficial, in a sense, in our work. For example, we do a lot of marking and recording of weapons, and those new technologies will actually help us better, more effectively do this kind of work, relating to marking, tracing, and record-keeping as well. So this is the nature of our new technologies; it's always dual-purpose. There is a positive side and there is a negative side. Unfortunately, I get to talk more often about the negative side, the dark side. They always say that I am woman from the dark side. But we need to spend more time, I think, focusing on how we can also use those technologies for our purpose of arms control and disarmament. I think there isn't enough discussion actually highlighting the beneficial side of these.

But here again, even on the conventional weapons side, we need new approaches. This is actually an everyday challenge, as I said. I think it was Secretary-General Kofi Annan who called

small arms and light weapons "weapons of mass killing". They are killing people on a daily basis; while at the same time we look at the nuclear field and fortunately, because of the use of nuclear weapons in conflict, no casualty has happened since Nagasaki. So we need to make sure that we pay attention and we intensify our efforts with new approaches here again in the conventional area, and we have to do that again with voices actually being heard from the global South. It's a really important agenda for all of us.

Marie-Louise Nosch: I'm sure that new technologies are already very much expanding the framework of how the development of conventional weapons is taking place, and I feel that an example of this was that there used to be a race in numbers – how many nuclear warheads there were on each side; while today, we've seen also in Ukraine that it's not just a question of numbers, it's also a question of how modernized and how optimized things are. And I think, even if we don't see an increase in numbers, we see the modernization of old weapons being used in new ways or opti-mized in different ways, so there is also an expansion of the beliefs that there were before.

Giorgio Parisi: I would like to discuss one particular point that is present in the declarations of the academies of the G7 countries, which was signed by all the academies of these countries in Paris in 2019. The problem is essentially the following: artificial intel-ligence opens new possibilities for military application. And now we have weapons that have significant autonomy in the critical function of selecting and attacking targets. These autonomous weapons may lead to a new arms race, because they also lower the threshold of war, or they might become tools for terrorists. Some organizations have already called for a ban on autonomous weap-ons, similar to the convention regarding chemical or biological weapons.

Such a prohibition would require a precise definition of weap-ons and autonomy. However, in the absence of a ban on lethal autonomous weapons systems, it is not clear how you can show that these weapons are in compliance with international humani-tarian law. The point is that these weapons should be integrated into an existing command and control structure in such a way that the responsibility and the legal accountability remain associated with specific human actors. It is clear that we are in great need of discussion on this point, which is not talked about so much in the political arena, at least in Italy.

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Migration in the Post-Pandemic World

Luigi Maria Vignali
António Vitorino
José Luís Cardoso
Giorgio Parisi
and Wolfango Plastino

Introduction
Luigi Maria Vignali

Irregular migratory flows in the central Mediterranean are growing rapidly and there is a worrying increase in unplanned departures not only from Libya and Tunisia, but even from countries such as Egypt, Turkey and Lebanon. So, it is indeed important to have opportunities for dialogue and discussion on such a key topic.

In 2019 there were around 11,000 irregular arrivals via the Central Mediterranean. In 2020, that number tripled (around 34,000) and then almost doubled in 2021 (67,000 arrivals). This trend has been confirmed in the current year (+45% of arrivals in the first 8 months of 2022).

Unplanned international migration is a growing phenomenon, and more resilient to the adverse impact of a pandemic crisis than regular international mobility.

Instability of entire regions of sub-Saharan Africa, negative effects of climate change – which jeopardize the food security of entire continents – and population growth, especially accentuated in African and Asian countries, are factors that are likely to fuel an even greater propensity to emigrate in the years to come.

The scale of the challenge is such that no country can cope with it alone, and this is also true for Italy. At the same time our geographic location, which makes us a natural gateway to Europe, cannot be a factor that penalizes Italy in managing the flows, while we are facing our humanitarian tasks of saving lives at sea – which, by the way, is in compliance with international law.

The European Union and its Member States must show concrete solidarity to border countries, not only in receiving those refugees in need of protection, but also in managing all the migrant flows crossing the Mediterranean Sea – including so-called "economic migrants". The solidarity of the other Member States of the European Union cannot rely only on their willingness to engage in the reception of migrants.

On the one hand, we need a common European mechanism for dealing with migration flows; at the same time, there are also different means, along with or even instead of the mere redistribution

of migrants, to face this common priority. For instance, Italy has repeatedly stressed the importance of funding the external dimension of migration and the European action in third countries of origin and transit as an alternative to migrants' relocations. This would allow for the strengthening of the European dialogue and migration partnerships with those countries, especially in Africa, with a view to fighting migrant smuggling, preventing irregular and uncontrolled migration and ensuring an orderly and regular migration.

This should be our key objective: the replacement of unplanned, unpredictable and unskilled migration flows with regular, planned and skilled ones, also taking into account the economic development needs of the destination country.

To this end, for many years now we have been working with the International Organization for Migration (IOM) to boost our cooperation with third countries of origin and transit, which is at the basis of the Italian strategy for the stabilization of migratory flows.

Through the Migration Fund of the Ministry of Foreign Affairs (MOFA), our cooperation with the IOM has been financing projects on: 1. assistance to migrants and refugees; 2. assisted voluntary returns from third transit countries to countries of origin; 3. interventions to address the root causes of migration; 4. technical assistance programmes for the authorities of third countries of origin and transit of flows; and 5. information and awareness campaigns on the risks of irregular migration.

More specifically, I would like to mention two significant results in preventing unplanned migration flows: assisted voluntary returns (AVRs) and awareness-raising campaigns on the risks of irregular migration.

AVRs, one of the cornerstones of our strategy, serve a twofold purpose. First, they offer a free, legal, safe and dignified alternative to return home for migrants stranded in third transit countries, in many cases also providing an assistance package to facilitate their socio-economic reintegration. Second, they contribute to reducing the presence of migrants in third transit countries where they could fall victim to trafficking networks, allowing for a reduction in migratory pressure on these same countries.

From 2017 to the present, through the Migration Fund, the MOFA has supported the IOM's actions in Libya, Niger, Tunisia and Sudan and most recently in Côte d'Ivoire, helping to carry out the assisted voluntary return of over 86,000 migrants who might otherwise have attempted to reach Europe irregularly. This is really a considerable figure.

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The Migration Fund has financed extensive community awareness-raising activities on the risks of irregular migration and the opportunities offered through regular channels. Through communication tools (cinema, social media, radio and events such as workshops, theatre performances and photo exhibitions), as well as through public figures (in the countries of origin or diasporas abroad), these awareness-raising campaigns have reached hundreds of thousands of people, many of whom are inclined to leave their homeland irregularly without being at all aware of the risks involved.

International migration, primarily unplanned migration, will continue to be one of the great challenges we will have to face in the future. We will continue to strengthen cooperation with countries of origin and transit, helping them manage the migratory flows while fully grasping the positive contribution of migrants to our societies.

In addressing such a complex challenge, the goal, as Pope Francis has stated, is not only to welcome and to protect, but also to promote and to integrate – a complex task that can be fully implemented only through careful planning and ordered management of migration flows.

Lectio Magistralis
António Vitorino

As the Director General of the International Organization for Migration (IOM), the UN agency responsible for migration, I can say that we have become used to disruption as part of our *modus operandi*. Indeed, it is at moments of profound disruption – when systems become overwhelmed – the IOM becomes an even more critical source of essential support for migrant communities.

Moreover, at moments of disruption, we also discover the gaps that exist in the international and national architecture regarding migration, and often take steps forward to redress them.

Indeed, the New York Declaration of 2016, which led to the adoption of the Global Compact for Safe, Orderly and Regular Migration by many governments around the world, was born from a sense of crisis in Europe and recognition that there is a need for a common language and stronger international cooperation on migration.

And it is a sad truth that, today, we are becoming all too used to disruptions that test our immigration systems – largely through the unsafe, irregular, and unanticipated movements of people that are taking place across all continents of the world. We have, over time, built some contingency into these systems: indeed, the Temporary Protection Directive that was activated earlier this year to offer support to displaced Ukrainian nationals is a good example of this in Europe, and a welcome reminder of the humanitarian impetus that sits at the centre of the collective European spirit and values.

But the pandemic was a crisis on a global scale, one which brought unforeseen challenges, and responses. From the perspective of cross-border movement, we were not prepared for our travel systems to be brought to a standstill: the absence of movement has been a factor of disruption that surprised the world and continues to have far-reaching consequences on travel and mobility.

This morning, I would like to detail some of the immediate, and lingering, impacts of the pandemic for migrants and displaced

persons, and outline the challenges ahead, in a context where inequalities between communities have become starker since Covid-19 began to spread.

In February 2020, as governments became increasingly concerned about the spread of Covid-19, country- and region-specific travel bans began to be introduced, often with little warning. By late February, governments began placing travel restrictions on travellers from countries seen as high-risk, including Italy.

Over the course of March, several countries began to ban the entry of all passengers, regardless of origin, across all continents of the world, allowing only limited exceptions. Other measures imposed included health screenings at the border or requiring quarantine for new arrivals, in an effort to slow the impact of a virus, about which too little was known, on our societies and, critically, our health systems.

And as you well know and experienced, travel bans were accompanied by extensive domestic lockdowns, limiting interaction outside the household, except for those considered essential for the functioning of key services and meeting critical needs.

Over the past two and a half years, we have seen fluctuations in border closures and lockdowns, as subsequent waves of the virus, and new variants, have emerged, making life – and travel – less predictable. Here in Europe, we have the impression that much of the crisis is over; those who wish to be, are now vaccinated, and our daily life has returned to a cautious normality.

However, as of August 2022, 27 countries around the world were still issuing entry restrictions, while 137 countries have maintained health and other conditions for authorized entry (notably test and vaccination requirements). While the vast majority of people in high-income countries have received at least one vaccination, this figure drops to less than one in four people (23.92%) in low-income countries. The global experience of Covid-19 – and with it the speed of recovery – has varied drastically.

Regardless, at its peak, the impacts on all communities around the world were severe: children were kept from school, elderly people were isolated, and workers were left without income, while the Covid-19 virus left millions dead.

But what were the impacts on migrants?

Many of the impacts for people on the move were immediate. By the middle of 2020, the IOM had estimated that up to 2.75 million migrants were stranded worldwide due to travel restrictions, leaving many in situations where they were at higher risk of abuse, exploitation, and neglect, as they found themselves in irregular situations through no fault of their own.

Still more migrants hurried home at the outset of the pandemic, both independently and through government-sponsored schemes; many returned to countries ill-equipped to offer medical and social support to the arrivals or ensure adequate housing.

Many communities blamed the spread of the virus on foreigners, and the IOM has witnessed an increase in xenophobic and racist incidents directed towards migrants in many countries, including those returning home.

The economic impact for many migrants was swift and severe, and particularly for those migrants employed on precarious contracts, or working in the informal economy. As lockdowns commenced, and many industries came to a standstill, migrants were often the first to lose their jobs, in turn risking their legal status in their countries of residence. Migrant unemployment rates increased significantly in more than 75% of all OECD countries in 2020, a pattern matched in developing economies.

For many of those remaining in employment, the conditions of labour deteriorated: in some sectors, such as agriculture, migrants were warehoused in unsanitary conditions, where basic hygiene and physical distancing measures could not be met, placing their health at risk. During 2020, the IOM recorded numerous incidents of employers taking advantage of migrant workers' vulnerability, withholding wages and threatening to report irregular status to the authorities.

But at the same time, thousands of communities around the world recognized the essential role that migrant labour played in our economies and society. Migrants are overrepresented in key sectors, notably health and care work; migrants delivered food, cleaned public spaces, tended to the sick and vulnerable. Just as many migrants were discarded at the outset of pandemic, others were recognized as vital to pandemic response.

As travel restrictions persisted, for example, many countries sought to carve out exemptions for seasonal and essential cross-border workers, to ensure continued agricultural production or maintain key industries such as mining. We have, perhaps, learned to value migration at all skill levels, in a way that prior to the pandemic had been underconsidered.

In terms of social impacts, migrant communities often found themselves isolated and excluded, more likely to be living in close quarters with poor sanitary conditions and excluded from economic support measures put in place by governments. Pre-existing situations of poverty and marginalization were exacerbated during the pandemic, leaving individuals vulnerable to exploitation, including trafficking in persons. Just as the UN recorded

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increases in violence towards women during the pandemic, so migrant women have become particularly vulnerable.

Access to key services, notably health, was disrupted for many; many of those in irregular situations were fearful of accessing much-needed services, for fear of deportation. According to early research, incidence of Covid-19 amongst migrant populations has been consistently higher than for non-migrant groups, including in some high-income countries, due to poorer living and working conditions, and more limited access to health services. In some countries, such as Saudi Arabia and Singapore, migrant groups accounted for the vast majority of cases, due in part to the use of dormitories for migrant workers. Migrants held in detention around the world were particularly vulnerable to Covid-19.

But it is important to note the various efforts made by governments, supported by organizations such as the IOM, to mitigate these impacts.

During the pandemic, many governments recognized the importance of universal access to public health services, and the need to ensure not just that migrants have access to health support in principle, but also in practice.

The reality is that viruses do not check a person's immigration status prior to infection.

Those most impacted were those deepest in poverty, living in more crowded and less sanitary socioeconomic conditions, with fewer opportunities for social distancing, or those unable to afford time off work for social isolation. And migrants were disproportionately represented in this cohort.

Governments have also learned the importance of inclusion – including migrants in socioeconomic measures, in vaccination programming, etc. and the possibilities of innovative adaptation of immigration measures.

As lockdowns took hold, a number of countries, including Italy, offered blanket extensions of residence permits or asylum status to prevent migrants from falling into irregular status, even if they had lost employment. This was critical to prevent migrants from becoming stranded, without support, and contributed to addressing the overall public health challenge.

Some countries also invested in alternatives to detention for migrants, to avoid public health challenges, innovations that could be taken forward even after pandemic.

Governments have also learned the importance of information, and access to accurate information. During 2020, the IOM reached nearly 37 million beneficiaries, including migrants, internally displaced persons and other community members with Risk

Communication and Community Engagement activities. This was undertaken often in difficult contexts when lockdowns and social distancing was common.

For example, the IOM's mission in Italy translated critical Covid safety information into 26 languages during March 2020 – from Bengali to Igbo – to support community groups in their efforts, placed online for diaspora and NGO groups to access and utilize. As vaccinations have become available, we have pivoted to ensuring that migrant groups are properly informed about, and can access, injections, to overcome any hesitancy.

How are migrants – and migration – recovering?

It is too early to make predictions about the long-term impacts of the pandemic on migrants' economic trajectories. But early indications suggest that the recovery will be long, and that – collectively at a global level – we risk disrupting our journey to attaining the Sustainable Development Goals by 2030.

Incredibly, during the pandemic, remittances sent by migrants did not drop as dramatically as expected around the world, though this has varied country to country. Having dropped modestly by 2.4% in 2020, we have seen remittances grow globally by 7.5%, with even larger growth (8.6%) in low- and middle-income countries. Many migrants sent money home to address hardships faced by their families during the pandemic. But while remittances to Latin America and the Caribbean increased significantly in 2021 (up 25%), driven by the economic stimulus measures in the United States, remittances have remained less buoyant in East Asia and the Pacific, due in part to ongoing Covid-19 travel restrictions and continuing global economic challenges.

The broader impact of the pandemic has affected countries deeply reliant on migrant labour, in both directions. Developing economies with high numbers of emigrating workers are counting the cost of the pandemic. For example, in 2020, the Philippines saw a drastic 75% reduction in the deployment of Overseas Filipino Workers (OFWs), which constitutes the lowest deployment numbers in over three decades. Meanwhile, the number of Returning Overseas Filipinos reached nearly 800,000 by the end of December 2020, many of whom have struggled to find employment upon return. This has had a significant impact on the economy and society of the Philippines, where migration plays an integral role in development.

However, in developed economies, demand for labour has increased significantly, and governments have highlighted the need to address deep and persistent labour shortages across many sectors. As a result, governments from Germany to Australia are rethinking

their immigration systems at all skill levels, to draw new migrants into the labour market. Some of the shortages stem from a disruption to planned immigration levels in 2020 and 2021, and the inability of visa holders to travel to their destination; other shortages stem from the return of migrant workers home during the pandemic, many of whom are now less inclined to move again.

In 2021, much of the world's mobility recovered. Travel bans were increasingly replaced by health measures, and vaccination became an increasingly important precondition to travel. As variants impacted across the world, regions began to diverge in their responses, with European countries beginning to open up, while Asia and West Africa remained more cautious; airports were more likely to reopen than land borders – as easier to integrate health measures – which has meant an impact on local cross-border mobility in developing countries, essential to sustaining livelihoods.

Global mobility is beginning to rebound, despite significant visa processing backlogs across many systems, and difficulties restarting international travel due (in part) to staff shortages. The UN World Tourism Organization has estimated that the tourism sector recovered almost half (46%) of pre-pandemic 2019 levels during the first 5 months of 2022.

But the rebound is uneven in its effects. The costs of travel have significantly increased, which will continue to have a chilling effect on mobility for those without significant income, and particularly for migrants that cannot afford to meet those increased costs, or those that fear long-term separation from family or once again becoming stranded. Similarly, as many countries still require Covid-19 vaccination and testing for entry, would-be migrants without access to health services may be restricted from travel.

There is a risk that, in the post-pandemic environment, a two-tier system of travel is emerging, whereby those travelling from and to countries with high rates of vaccination find it easier to get around, while those in countries where Covid-19 risks remain significant – notably in developing countries – have fewer opportunities to move. Not only is this risk going to further exacerbate the income inequalities that have sharpened in recent years, limiting regional mobility in parts of the world that would most benefit from labour circulation; but those who continue to lack regular means of travel, may resort to using unauthorized routes, in the hands of smugglers or, worse, traffickers.

It is beholden on us in the international community to find solutions that can fully restore global mobility. This means increasing equitable access to vaccination and legal identity documentation,

as well as bringing governments together to ensure that the infrastructure created to manage health crises at the border is available to all countries in the world.

Thus, we believe that there needs to be a common global space to exchange information, establish common understanding and concepts, and identify gaps in capacity. Without this, borders may continue to open and close on an ad hoc basis, reducing predictability for travelers, migrants, and businesses dependent on mobility, and further deepening economic uncertainty.

To manage safe travel, states will need to find common concepts for integrating health into border management without unduly excluding either states, or migrants and travellers who may not be able to meet additional travel requirements. This is a huge challenge for low-resource countries which do not have the capacity to create new and complex infrastructure, particularly along porous land borders where daily crossing is a part of life; and these states may find themselves left out of the international travel system as a result.

This is particularly important for developing states. Deep political and technical investment has been made in recent years to support the African continent in terms of development and regional integration. It would be tragic if this progress were now reversed. Mobility and trade are inextricably linked. To recover economically, governments will have to re-establish safe means of mobility, and cooperate not only across borders, but across regions, to do so.

Post-pandemic: what are we likely to see in terms of global migration and mobility?

We have seen that our collective impetus to travel is elastic; however, some parts of the world are rebounding more quickly than others, which is having a deleterious effect on economic recovery in those parts of the world. But to understand the impacts of the pandemic on migration, we must look also at the other factors which are impacting how, when and where people move.

Covid-19 led to millions of deaths, catalyzed soaring levels of global debt and inequality, and limited cross-border mobility to an unprecedented degree for modern times. While the number of deaths is now reducing, the world faces significant economic disruption, linked to inflation and increased cost of living, and reduced fiscal flexibility.

With the world facing a global downturn, a significant number of countries, comprising a significant proportion of the world's population, are at risk of debt default. This, in turn, will affect political stability, and raise the risk of social unrest, as household

costs increase with uncertain government response, and potential migration and displacement.

However, economic constraints – from the macro to the household level – may also further polarize attitudes to migrants and refugees and increase scepticism towards current concepts of protection and support, even while demand for migrant labour at all skill levels persists.

The international community will be called upon to respond to increasing needs in developing and fragile countries, with less financial support, as long-standing and protracted crises are joined by new situations of acute humanitarian concern, and proliferating food insecurity.

Climate change will continue to intersect with continued inequality, demographic change, and economic factors to affect the way people move and where they move. Investments in disaster risk reduction and climate change adaptation will be critical to address environmental drivers of migration and prevent forced displacement, and the costs of global response will increase. While most climate-related mobility is expected to remain internal, we cannot discard the likelihood of further movements internationally.

The situation in Ukraine exemplifies how conflict, both civil and transnational, can affect broader migration and displacement patterns across regions, and can have serious spill-over effects for regions that are seemingly unconnected.

On the one hand, the response to those fleeing Ukraine highlights the capacity and willingness of governments, supported by the international community, to manage large-scale movements. However, in other parts of the world, this capability is far weaker, and in contexts where the speed of mobility threatens to overwhelm existing management systems, quick protection responses are needed to avert humanitarian disaster.

Cities are already home to most international migrants and continue to attract internal migrants. Rapid and unmanaged urbanization will increase vulnerabilities, fuelling for instance an increased informalization of labour and growing exposure to disaster risk, as mobile urban populations move to environmentally fragile areas. The demographic weight of youth in areas most vulnerable to climate impacts will likely increase future out-migration of young people, notably towards urban areas. Thus, the role of local government actors, and the leadership of mayors, will become ever more important, both in terms of managing change, and planning for the future.

I have offered you here a gloomy outlook, post-pandemic, and I believe we must urgently, and soberly, view these overlapping

crises, and not shy away from the challenges they present to human mobility, the rights of those most vulnerable to their impacts, and the prospects for ensuring safe, orderly, and regular migration.

But there are also new opportunities to connect migration to economic growth, social cohesion, and human development.

Our experience with remote work during the pandemic has opened up a new area of exploration: when should people move, when should skills move, and how might remote work help revitalize declining regions?

How might we create links between those countries experiencing sector shortages and the needs of those in climate-impacted regions to build new livelihood strategies, including through migration?

How can we ensure that people who find themselves impelled to undertake dangerous journeys, including across seas and oceans, have access to safer alternative pathways?

How can we channel humanitarian and development funding to create maximum impact and build not just individual but community resilience, offering the next generation better opportunities?

The IOM is working towards solutions in all of these areas; they have been impacted by, but stretch far deeper than, the Covid-19 pandemic itself, and will deeply affect the next decades of migration and mobility worldwide. I look forward to discussing with all of you the challenges and opportunities of the post-pandemic world, and its impacts on migration.

Discussion *

António Vitorino, José Luís Cardoso, Giorgio Parisi and Wolfango Plastino

Wolfango Plastino: *What lessons should we learn from the Covid-19 pandemic from a migration perspective?*

António Vitorino: To begin I will say in a nutshell that for the first time there has been recognition that migrants are essential workers, for a number of critical activities, to the benefit of the entire community. The ones who took the health risks were the migrants; they were the ones in the front lines, but the beneficiaries were the entire community.

Secondly, we were not prepared for the pandemic. And we need to prepare for the next pandemic. Let's be very honest: there will be a new pandemic one day. If the public opinions of our countries have accepted that, to a certain extent, we have run after the disaster – I mean, we have tried to respond to the pandemic, because we were totally ignorant of the impacts of the pandemic – when there is a new pandemic I think that the public opinion will not have the same tolerance and the same patience towards the public authorities. And there will be a need to show that we have learned the lessons from the previous pandemic, and that we are prepared for the next one.

And last but not least, I think that one has to recognize that universal health care is not just a tribute to the fundamental rights of migrants and a sign of respect for their human dignity, but at the same time it's in the key interest of the host communities; because if we allow migrants to become a source of spreading the virus because we do not allow them to have access to healthcare, of course we are creating stigmatization against the migrants – that's quite clear – but at the same time we are putting the entire community at risk. So it is in the name of the self-preservation of the

entire community that we need to make an effort to guarantee that all migrants, irrespective of their legal status, have access to healthcare, and particularly now in the present moment to vaccinations.

José Luís Cardoso: First I would like to thank the Accademia Nazionale dei Lincei for this kind invitation to participate in this roundtable. It is indeed a great honour and a pleasure to take part in this discussion, and my greetings to professors Plastino and Parisi and President Antonelli from the Accademia dei Lincei, and to all Excellencies present at this *colloquium*. And allow me to single out my special *cumprimentos – muita estima* – to the Director General, António Vitorino.

In his presentation, Director General Vitorino has given a very rich picture and a broad presentation of all the problems we will be discussing at this roundtable. So I guess that a certain amount of overlapping is unavoidable, although by repeating some of the things that have been said we might get a stronger message from this roundtable. Although a bit gloomy, as Vitorino said, this does not mean that his presentation was not realistic, and especially that he has not presented how to respond to the challenges and the problems that the pandemic has created as far as the issues surrounding immigration are concerned.

For the benefit of brevity, I would like to stress two particular points which I believe are the key lessons from this Covid-19 pandemic in terms of the consequences for migration issues.

The first one, as has already been emphasized by António Vitorino, is the need to include migrants in social and economic recovery plans. And this means putting forward not only legal channels that give migrants the possibility to benefit from inclusive public policies, special health policies; this is not only an issue of legal measures, but it is a process of including migrants in the recovery plans in each country that accommodates and receives migrants due to the Covid-19 pandemic.

Also, I believe that one of the lessons to learn here is urgency. We come to realize how urgent it is for us to achieve rapid responses regarding the efforts to foster transnational cooperation, namely in vaccination plans and the activation of public health practices. And the transnational message, which I would like to focus on here, might be the outcome of something we've realized with Covid-19, but which was not born with the Covid-19 pandemic: namely, the great divergence that exists between rich countries, or high-income countries, and low-income or low-resource countries. And if, when we try to understand the reasons

for economic growth in different countries, we talk about this great divergence that occurred in the long 19th century, I think that this divergence may be becoming greater again, and all these phenomena, like the pandemic, are unavoidably, and unfortunately, making things much worse than they were in the past.

But there is another point that I would like to stress here, which is that sometimes it is difficult to distinguish what are the consequences of the Covid-19 pandemic, as far as migration issues are concerned, and what are the consequences of other factors explaining migration, including other factors explaining the attitude toward migration. One of the lessons that I think is very important is the risk of anti-migrant sentiments, especially in rich and high-income countries. The reason I am referring to this risk is that sometimes Covid-19 explains only some of the reasons why this sentiment is getting more complicated and more difficult to deal with. This is a political issue, of course. We know – as António Vitorino has discussed – how the war in Ukraine might raise new challenges in need of a strong response, and especially as far as the sentiment of insecurity of migrants goes. Sometimes political contexts and political decisions are much more relevant than the simple or difficult effects originated by the pandemic.

What I mean is that there is a risk at the moment, not only due to the pandemic, but also due to the situation of war in which we are living, and the situation of defaulting which some economies are facing at the moment; all of this creates a sentiment of aggressive nationalism which renders the lives of migrants much more difficult than before. So when discussing the consequences of the Covid-19 pandemic, I guess that we should not forget the consequences for the lives of migrants that come from the political arena in which we are living now in Europe.

So this is my quick answer to the difficult question that Professor Plastino has invited us to discuss.

Giorgio Parisi: I think that this question from Wolfango was deeply discussed by the two previous speakers. I would like to add in any case some viewpoints from our special observatory, Italy, which is an important country, but with some of its own peculiarities.

First, I would like to recall a document that has been prepared by the Accademia dei Lincei more than two years ago, in May 2020, in which we stressed the need to avoid labelling migrants as illegal immigrants, because one should try to provide some kind of official recognition of the people that are present in the country;

they should have the possibility of accessing all types of health programmes, without having to be treated as illegal immigrants. And therefore it's clear that, while in principle in Italy everybody has the right to the national health service, people who are in some kind of illegality may refrain from making use of it, and therefore we made a document which stressed the need for this type of official recognition of migrants. This is also, as His Excellency stated, related to the things that were happening at that time in Singapore, because in Singapore there had just been the first wave of Covid-19, which was more or less controlled, but then there was a second wave of Covid that essentially ripped through the places where migrants were sleeping; these migrants lived in high-density housing, and in unhygienic conditions, so there was a greater possibility of airborne transmission of Covid to other people, and so it was clear that this explosion in Singapore was due to the poor conditions of migrants. But this explosion of Covid amongst migrants later affected society as a whole, because afterwards it spread to other sectors of society.

Concerning the effects of Covid, first of all, we have to understand that Covid has shown that our hyper-connected world, the world of the global economy, is very fragile. Once our supply chain become extremely long, even planet-wide, it's clear that everything becomes more difficult, and disruptions of the supply chain may have a dramatic effect that would not play out if we had local short chains. I think of the beginning of the pandemic, when Europe discovered that there was no company that was producing individual-protection facemasks, and these had to come from very far away, and this was not easy, because there was a worldwide shortage.

Coming back to the consequences for migrants, one thing that happened because of the Covid pandemic was that an incredible strain was placed on the healthcare and medical services in Italy, and this had a number of negative consequences, because the working conditions of doctors worsened, and what happened in Italy is a phenomenon that already existed in the past: namely, that many Italian doctors emigrated abroad. So we have in Italy, thanks to the combination of a somewhat low number of medical school graduates and a strong overseas migration, a decrease in the number of doctors, and this is dramatic, because there is a serious staffing shortage in many public positions, especially in emergency rooms, because these are one of the worst places of work from many points of view, beginning from the stress of it. And so it happened that in this particular

case, Covid had a dramatic effect on Italy, exposing it as a country short on healthcare workers due to emigration, which was already a well-known characteristic for Italian scientists; but this was something still more dramatic, because it is something that affects our society as a whole.

Wolfango Plastino: *What role does data play in understanding migration dynamics?*

António Vitorino: It plays a crucial role, because if we want to prepare policies based on evidence, we need to collect data. It's quite a challenge, because as you can imagine, not all governments worldwide are equally equipped to collect data. IOM collects data; we have our system, which is the Displacement Tracking Matrix (DTM; it's an awful name, I *do* recognize that). DTM is deployed in one hundred countries all over the world, particularly in countries which are more relevant in terms of the source of migratory flows. So we collect the data, and we analyze the data, but we are always in search of a more and more granular understanding of the data. We have data on stocks of migrants, and data on flows. But we need to go the extra mile, and disaggregate this data, for instance by gender, by age, by some specific characteristics, like disability, because that's the only way we can understand the flows. And it would be desirable to use big data and artificial intelligence in forecasting. We are doing forecasting now, with all the precautionary measures that forecasting human mobility and human nature requires.

But I think that the progress in technology has been extremely relevant. We have changed lots of things that we have done historically, by switching to online, embracing technology, and now we have kept those processes in the house. That will allow us to have a better capacity to collect and to analyze data. But – and there is a big but – of course in the developing world, many countries do not have the capacity to collect data. And so we need to invest in supporting them in two critical areas: first, data collection, having data statistics and the capacity to collect reliable data; and second, legal identity. I will not elaborate on this point, but having legal documents is extremely important. There is a large number of countries that do not have a civil registry, that do not have identity cards, and in order to promote lawful migration, we need to guarantee that people have access to legal identity and to legal documents. It's worth supporting those countries in those two areas: data and legal identity.

José Luís Cardoso: Of course I agree that data is instrumental for the design and implementation of foreign policies, and managing data is paramount for politicians to make the right decisions and justify their choices; this is obvious. Also because data is fundamental in order to render political problems and political issues and political decisions as technical ones. The only way of presenting something as the outcome of evidence is to have data, and I do believe that the work being done by the IOM is absolutely fundamental for this purpose, and I also agree that national statistical institutes or bureaus should be compelled or should be required to provide adequate data allowing for the monitoring of migration policies.

It's not only an issue of quantitative data. I would like to raise an issue that should not be forgotten: we also need qualitative data on this for the development and monitoring of migration policies – namely, migration as a source that can explain the change and transformation of labour regimes and business activities. And it is important to understand how migrants can bring this change to the countries in which they come to work, and so this data on the change of labour regimes and the participation in different business activities, I believe, is quite important.

Another point is to understand migration in diasporas as channels of transmission of cultural, economic and social innovations. And so a better understanding of these plural identities that migrations bring to the new countries that receive them is also fundamental to understand the dynamic process of migration.

So I would not stress only quantitative data, which is absolutely paramount for the design of public policies, but we also need a better understanding of migration in terms of the changes and the transformations that migrants bring to the cultural, economic and social world in which they are now living.

Giorgio Parisi: I think that data are crucial, because otherwise without any carefully taken data – because one also has to be careful to try to understand the biases that might be in the data – one can only rely on prejudice in making decisions.

And of course, the higher the quality of the data, the more we know about the immigrants or what they do, the more data available on their socio-economic situation of their country before becoming immigrants – all this is extremely important, because it provides us also with some information on the kinds of migrants that have been integrated into society and those that have not been integrated. Of course, this kind of data is extremely difficult to gather, but it is important, however tentative.

However, speaking of general arguments on data, I think that it is extremely important that this data, as far as possible, should be made public; I mean that people from universities, from institutes of research, from all kinds of activities, that want to understand what is happening, should be able to access it. It's wonderful to use modern technologies to make predictions, but of course there could be different ways to make predictions, different ways to analyze the data, and if you want to sum up this kind of prediction that you are making in scientific predictions, you need the data to be open to the whole of the scientific community. And opening the data to the scientific community is not simple, because you need first of all to decide to open them, you need an organization that organizes the data in such a way that they can be made open, and of course there are all the privacy concerns and so on, so it's a big effort to open the data, but I think that it is absolutely essential. The more people can get their hands on what the data are and what the data imply, the less noise there will be about immigration, and the more facts about it.

Wolfango Plastino: *Often we talk about migrants, but not with migrants. What are your views on engaging the diaspora in conversations about migration, and contributions to both country of origin and destination?*

António Vitorino: You have touched upon a very critical issue. I think that IOM now has given an absolute priority to organizing the diaspora, thanks to the very good example that we have of engaging the diaspora, not just supporting the integration of new generations of migrants in these societies, but also in terms of the development of countries of origin.

There is a lot to be done in this respect, I must say. But I can give you one very concrete example. Ukraine is a country that has a very strong diaspora all over the world. There are 20 million Ukrainians all over the world who are very well organized as a diaspora and who have been extremely relevant in supporting the Ukrainians that have left Ukraine after the breakout of the war. That's why in May of this year, in Dublin, together with the government of Ireland, we organized a global diaspora summit that approved a declaration, which has been subscribed to, up to now, by thirty countries all over the world; this declaration was channeled to the Progress Declaration of the International Migration Review Forum, and was endorsed by the UN General Assembly.

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The agenda is precisely how can we mobilize the diaspora in terms of fostering the development of countries of origin.

I have given you the figures of the remittances. This year the remittances will surpass 700 billion US dollars. That's 700 billion US dollars. The remittances are more than foreign direct investment and external health assistance together. So we are talking about a huge potential to use that money not just to support the families back home (which is of course very important) but also to channel it into the development of the countries of origin. I believe that the international financial institutions, starting with the World Bank, should be much more focused on how to make that money, that huge amount of money, more productive, to address the deep-rooted causes of migration in the countries of origin.

José Luís Cardoso: I believe that, even more important than talking about migrants and talking with migrants, is listening to them, and giving them the voice they need to express their problems, their feelings and their motivations. So I think that we should foster the construction of narratives, allowing a new awareness of the role of migrants to contribute to economic recovery in their destination countries, and also their contribution to social demographic imbalances, as is the case of Portugal, where there is the problem of decreasing population. I think that we should rely on these kinds of new forms of argumentation based on facts and life stories, justifying their interests and explaining their claims. We should give the migrants a stronger and a louder voice.

The narratives of resilience, for instance, denouncing the suffering which is associated with the pandemic but also with their difficult conditions of living, and the solutions that they can propose. By doing this, we give an alert to the world on issues that have global impact, I believe.

These narratives and giving migrants a voice is also, as António Vitorino was just stressing, a challenging instrument of diplomacy, since these narratives allow the expression of the voices of citizens who are most of the time marginalized or even denied, and who therefore have no possibility of expressing their problems in the political and diplomatic arenas. So again, there is a political issue here: the relevance of the political context and the political constraints that may or may not allow migrants to raise their voices. And this is of course a question of rights, the constitution of organizations that are representative of migrants; it is a matter especially of insisting on the Humans Rights acts and the freedom of expression that we should give them.

Migrants are not merely workers. They are persons, and their narratives can better explain the world and the problems of the world we live in.

Giorgio Parisi: I think that this idea that we have of listening to migrants is extremely important, because immigration is a very important phenomenon in these days, as we know, and we are observing most of it from our viewpoint, which is clearly a partial viewpoint. There are so many, many things that we do not understand. For example, why, in some countries, immigrants from some countries have been more integrated than immigrants from other countries, without any clear evidence of this being related to the socio-economic conditions of the initial country. One has to understand what are the real factors which make it difficult for some communities to integrate, and we have to remove these.

The other extremely important thing in speaking with migrants is to understand what the motivations that brought people to decide to immigrate to our countries actually were. It's clear that in most cases, the migrants were not satisfied with their position in the countries where they were, but knowing exactly what were the most difficult problems that they faced, we could maybe try to help them, in order to construct a better life in the place where they come from. It's clear that if that country has some specific issues, we should push to help this country in that particular direction. But being a scientist, my idea is always that the more we know, the more we have the power to understand the world and to change it.

Wolfango Plastino: *The climate change will have an impact on patterns of mobility, and we need to address this comprehensively. What does that mean in concrete terms?*

António Vitorino: If you want concrete terms, I'll give you concrete terms. In 2021, we estimate that 23.7 million people were forcibly displaced because of extreme weather events, natural disasters and slow-onset environment degradation. This shows us that climate change is ever playing a more crucial role in putting people on the move. Climate change is ever more and more associated with food and security, because climate change changes the conditions of life above all in rural areas. If you look at the African continent, you will see that there is a strong trend of urbanization, people moving from rural areas to the city, cities that are not prepared for such an inflow, and many of the reasons why people

move is because the traditional way of life in the rural areas is no longer viable because there is a shortage of water, because there are constant floods or because there is drought. Just look at what is happening today: 30% of Pakistan is flooded. That's almost the territory of Germany. You have a terrible drought that has displaced millions of people in Somalia, in Ethiopia and in Kenya.

This is true also in Central America. It was very interesting when Professor Parisi was speaking about motivations. We do screenings about motivations, and one critical motivation for Central Americans to migrate to the United States is clearly family reunification. But then, historically speaking, the second reason was violence by gangs. What we see today in our surveys is that climate change and the impacts of climate change in Central America and in the Caribbean is surpassing violence of gangs as a reason to migrate. It is expressly assumed by migrants, who say they could not go on living the way they were.

So the challenge is first to understand that we need to build resilience in these communities. I am not saying that the solution is to migrate. In fact, the figures that I've just given you, 23.7 million people, in the vast majority of cases, do not become migrants, they become internally displaced people. They move inside the same country. The point being that, once you start moving, you can easily cross one international border, and no longer be an internally displaced person, but also an international migrant by definition.

So we need to address the impacts of climate change. Just read the Groundswell Report that was published by the World Bank. The World Bank is very clear: if we do nothing in building the resilience of these communities, by 2050, we might have something like 260 million people on the move because of climate change.[1] The priority now is to look at the fragile sites, those places where we have rising water, persistent drought, or constant floods, typhoons, cyclones, which are becoming ever more frequent and harsher; we need to plan in those areas to build resilience in the communities, to invest in adaptation, and in mitigation of the impacts of climate change. Otherwise, the impulse to movement will be unstoppable.

José Luís Cardoso: The quick response is of course that climate change is not fake news, and that we should not accept climate

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[1] World Bank Group, *Groundswell: Acting on Internal Climate Migration*, Part 2, 2021 (https://openknowledge.worldbank.org/handle/10986/36248).

change being denied by politicians. Every day we are confronted with the terrible news of the lack of water in some countries, excessive rain in others, hot temperatures, coastal erosion, the increasing CO_2 emissions, and of course the increasing vulnerability of the populations that are left behind, escaping from floods and natural catastrophes, but also escaping from wars, starvation and malnutrition.

There is this idea that the environment cannot be controlled as it was supposed to be in the recent past, and there is also this growing concern with the capacity of human beings to create or keep the conditions for securing their future on Earth. These human predatory activities are a permanent threat to a sustainable planet. Of course, as far as migrant dynamics are concerned, we have to accept people's expectations for safety and of well-being, and the prospects that they have to lead a dignified life in their area of origin or in their potential destination area, where they are moving. There are of course these processes of adaptation and mitigation, and we believe that rich countries should embrace the responsibility of taking care of those who suffer more from the losses caused by extreme phenomena associated with climate change.

Here, I would like to come to one of the gloomy visions presented by Director General António Vitorino when he referred to the risk of not being able to reach the Sustainable Development Goals Agenda in 2030. I think that the political response to this is to trust that this agenda of sustainable development goals – for everything is there in these 17 goals – should be reinforced, and politicians should be encouraged in their countries to put forward the measures that face the big issues that the United Nations and also the European Union Agenda for Sustainable Development Goals have identified, so that they can be really reachable in 2030.

Without that, there will be terrible consequences, and of course migrants are undoubtedly amongst those who suffer the most.

Giorgio Parisi: I think that the effect of climate change on migration is one of the worst effects of climate change. The problem, as has been pointed out, is that climate change has the effect of changing the global atmospheric circulation; more water is evaporating, because it's hotter, and so there is more rain, and this rain is now falling preferentially over soils where it fell less before, while some other places are much drier than before. So it's clear that this may produce effects that are a complete disaster for agriculture, and the point is that it's very, very difficult to predict exactly what's going to happen, because it's very difficult to predict weather effects.

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Something that I hope we will never see, but which is an open possibility, is that the effect of climate change will stop the Gulf Stream. If the Gulf Stream is stopped, we will see many climate migrants from Norway, Scandinavia, England, and many parts of Europe, because that will correspond to a ten degree fall in the temperatures in Northern Europe. So it's clear that this has possible effects that are difficult for us to quantify and to predict in advance.

In any case, it would be best to make forecasts, as much as possible, five years or ten years ahead, and to try to do what is needed; and it's clear, for example in the situation of Pakistan, that there is very little that you really can do. I mean, it's difficult to understand exactly how to improve such a situation. Of course, we should try to watch everything, water and so on. But it's definitely not easy.

Wolfango Plastino: *What advice would you give to the next generation of migration scholars?*

António Vitorino: For the next generation of migration scholars, I have very good news: you will not be out of a job! There are so many things we need to understand and to learn, and we need to be very humble and recognize that we do not know. You will have plenty of work and plenty of jobs.

This is not advice, it's only a suggestion: be as multidisciplinary as possible. Because what we see in real life is that the causes of migration intersect with one another, and they are very diversified. There is no one-size-fits-all system, so we need to go to the field and to understand this deeply human phenomenon that is migration. Therefore we need economists, but we need data analysts; we need social scientists, but we also need anthropologists, who have a key role to play to explain to us the interaction of the different peoples worldwide. Be as multidisciplinary as possible; no one alone can achieve everything. Joint work, teamwork, sharing experiences and sharing knowledge – that would be my strongest suggestion.

José Luís Cardoso: This is not the one-million dollar question, but the two-million dollar question that you have raised. Of course, I agree with what Director General António Vitorino has just said. I think that we need to understand that the study of human mobility is the study of the difference between high-income countries and low-income countries, and the study of social inclusion and

exclusion and social and economic inequalities. Of course, we need academia and we need scholars to raise these issues again and again.

We especially must have no doubts about the defence of the principles of citizenship and basic human rights. Without the defence of these principles, we cannot understand how to incorporate migrants in our societies. These principles are sacred, I would say.

Also, we need education against xenophobia, against racism, against all the varieties of social discrimination, and we need to voice very loudly these basic principles of our life in democracies.

Then, there is the political fight, within the rules of the democratic game, against the discrimination and inequality of course affecting the migrants' lives. I believe that, apart from all the contributions from the different social sciences and from different scientific fields, we also need a political response; we must understand that migrants are not those who should be always left behind, but those who should live and share the well-being of richer societies.

Giorgio Parisi: What I would like to say to them is very simple: there must be many of you. We need many scholars, climate scholars, so there should be many of you because there will be an incredible amount of work to be done.

But let me add that in order to have many scholars on climate, that have all the characteristics that we have stressed before, for instance interdisciplinarity and things like that, it's clear that the university must start to contemplate preparing them. There should be a doctorate, some kind of interdisciplinary doctorate, in order to prepare people to do this kind of job. Because if we do not prepare people to do interdisciplinary jobs on migrant movements, migrant scholarship, if we do not prepare migrant scholars we will have just a few of them. If there are to be many of them, I think that we have to ask our universities to prepare many of them. Otherwise, we will have a shortage, and if we have a shortage, we will not be able to understand what is going on.

The Global Outlook

Short Term Pressures vs *Structural Transformations and Reform*

Ettore Francesco Sequi

Mathias Cormann

Julie Maxton

Alberto Quadrio Curzio

and Wolfango Plastino

Introduction

Ettore Francesco Sequi

Leonardo da Vinci's wheel is the image chosen to represent the *Colloquia*. Leonardo quite effectively described the role of science – also in connection with diplomacy – when he wrote that "those who want to practice without science can be compared to helmsmen that navigate without a compass or helm: they are never sure where they are heading".[1]

The wheel is one of the most iconic drawings by Leonardo da Vinci, along with the Vitruvian man. This is also relevant with regard to the interaction between science and diplomacy, as it reminds us of the central place occupied by the human being in governing scientific progress, as well as the harmonic connection between man and nature.

According to a definition by the UK Royal Society, science diplomacy, as a concept, spans from informing foreign policy objectives with scientific advice (science in diplomacy), to facilitating international science cooperation (diplomacy for science), to using science cooperation to improve international relations between countries, regions or organizations (science for diplomacy).

The most defining challenges in the 21st century have a scientific dimension. And they require global solutions.

Nowadays, we are struggling to cope with the consequences of a double shock. Our economies and societies were already hit by the pandemic, when they had to face the most serious political, military and humanitarian crisis in Europe since World War II. The unprovoked and unjustifiable war of aggression by Russia against Ukraine has changed the geopolitical, strategic and security framework. This double crisis is shedding a light on the vulnerabilities of our globalized economies, against the backdrop of

[1] Leonardo da Vinci, *Libro di pittura*, circa 1540 (Leonardo's manuscript on painting, Vat. Urb. lat. 1270): "Quelli che s'innamorano della pratica senza la scienza, sono come i nocchieri che entrano in naviglio senza timone o bussola, che mai hanno certezza dove si vadano".

pre-existing mega trends such as climate change, the green and digital transition, and mass migration.

In the West, we have put in place a firm, cohesive and effective response to the war, in close coordination with allies and partners. The Organisation for Economic Co-operation and Development (OECD) itself has promptly condemned in the strongest possible terms the Russian aggression, displayed full solidarity to the Ukrainian government and people, and expressed readiness to support the recovery and reconstruction of the country, when conditions will allow. Therefore, let me take this opportunity to express to Secretary-General Mathias Cormann our full support of the OECD stance towards Ukraine.

We need to look ahead and learn from the present crisis, laying the foundations for building more resilient, inclusive and sustainable economies and societies. Those conditions would also be conducive to peace. In order to do that, we need science and diplomacy to work hand in hand and find solutions to global challenges.

That is precisely the lesson we can learn from the OECD experience.

The Organisation was conceived to help re-build Europe through the Marshall Plan after World War II. Sixty years later, Ministers reaffirmed the very same shared values, promoting and prompting advances in science and technology as the most important drivers of productivity, growth, and improvement in living standards. And these advances must be shaped responsibly through effective governance, by developing standards for new and emerging technologies, in line with common values.

Today, global openness and interdependence – which many believed to be the best way to facilitate the diffusion of technology and to lift people out of poverty – are increasingly challenged. We have energy, food and health insecurity. We can see now risks connected to strategic dependence.

It is fundamental to find new instruments to foster economic resilience against shocks, prevent disruptions and ensure security of supply while keeping markets open. This requires science and diplomacy to work together. In this regard, the OECD does have a say, also in preventing beggar-thy-neighbor policies or protectionism.

The OECD can provide a platform, such as the Global Science Forum, for international collaboration in science to address inter-related societal, environmental and economic challenges. It can help identify the game changers of tomorrow and pool resources to unleash innovation in key areas. We also need more

mechanisms and spaces for dialogue between governments and the private sector, academia and the civil society, notably at the international level. This would definitely encourage investments and breakthrough advances.

Analysis of the economic and social consequences of progress in areas such as artificial intelligence, space economy, green and digital transition, trends in Research and Development (R&D) investment and science competence levels is essential. We appreciate the OECD's activity in this respect. We also commend its role in providing countries, through its peer-to-peer reviews, with a toolbox to foster a sound environment for innovation, to invest in the foundations – such as research, education and knowledge infrastructure – and address critical barriers to innovation.

In 2021, during its presidency of the G20, Italy promoted, together with the OECD, the historical agreement on the reform of the international tax system, to make this system fit for challenges arising from the digitalization of the economy. This is a good example of effective multilateral diplomacy supported by evidence-based analysis.

Italy and the OECD successfully worked together to advance the international agenda on the green and digital transition, as well as on gender equality, including by closing the gender gap in STEM.[2]

We also launched the Inclusive Framework on Carbon Mitigation Approaches. It fosters evidence-based dialogue so as to enhance cross-border cooperation on carbon-mitigation policies, support the transition to net zero, and avoid carbon leakage.

Climate change is perhaps the most prominent and promising issue, where science and diplomacy together make the difference. The Paris Agreement marked a turning point in the global fight against climate change, with negotiations heavily relying on science. The Italian G20 presidency worked towards the objective of keeping the goals stated in the Paris Agreement within reach. This endeavor continued with the COP26 summit, in Italy's role as partner of the UK Presidency, as well as during the recent COP27.

Italian foreign policy relies on science not only in its multilateral action, but also to strengthen bilateral relations.

The Ministry of Foreign Affairs, in close cooperation with the Ministry of University and Research and others, upholds the internationalization of the Italian scientific and technological research

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[2] Science, Technology, Engineering and Mathematics.

and innovation system, through executive protocols and joint research projects.

Our diplomacy counts on a network of 49 scientific and space attachés appointed to the Italian Embassies and Consulates around the world.

They promote Italian excellence in scientific and technological research and support the internationalization of Italian agencies and companies, especially those operating in high-tech sectors, such as in the space domain.

Diplomacy supports the development of new technologies aimed also at the innovation of production processes, with positive spillover into trade, economy, and the environment. The Ministry contributes to attracting investments in innovative enterprises, startups and research facilities. We also promote the encounter among innovators from all over the world.

Science influences the processes and ways of doing diplomacy. Digitalization, for instance, is having a remarkable impact on international relations and on the geopolitical positioning of many states, to the extent that new branches of diplomacy, such as cyber and digital diplomacy, quantitative analysis and strategic foresight have emerged.

The digital transformation implies a paradigm shift, which needs to be mastered and properly managed.

Looking ahead, automation and artificial intelligence will replace some jobs and transform many others, but diplomacy will certainly continue to rely mostly on the human factor.

In 2024, Italy will preside over the G7 summit. Science diplomacy will certainly play a major role. We know we can rely on the OECD to support our priorities in this endeavour. We attach the utmost importance to promoting a resilient and strong recovery, to pursuing the OECD enlargement process and global outreach, to strengthening the relationship with Africa, and to leveraging the OECD Centres hosted by Italy in Trento, Caserta and Ostia.

To return to the wheel drawn by Leonardo da Vinci, it was meant to refer to perpetual motion, even though the great genius thought that such a phenomenon could not exist in nature. Against the current global scenario, we need to make sure that the wheel of diplomacy keeps moving, that channels for dialogue and communication remain open. We will spare no efforts in this purpose.

Lectio Magistralis
Mathias Cormann

From Galileo Galilei, to Giorgio Parisi – one of last year's Laureates of the Nobel Prize in Physics – the Accademia's members have through their research made truly exceptional contributions to our understanding of the world:
– Research to help understand the scientific dimensions of phenomena like climate change and pandemics;
– Research to shed light on our changing societies;
– Research to uncover new technologies to help tackle some of our shared challenges;
– Research that questions assumptions and conventional wisdom, to help expand the very frontiers of human knowledge.

The research of members of distinguished institutions like the Accademia provide vital input to the OECD's own efforts to provide comparative data, identify policy best practice based on evidence, and promote common standards for a better world. At the OECD, we share the drive to harness data, evidence and knowledge for a better world. Better knowledge and understanding leads to better decisions.

Governments, policymakers and societies need the contributions of knowledge-based institutions today more than ever, as we are navigating a profoundly challenging and disruptive period in our shared history.

After two years of dealing with the Covid-19 pandemic, and just as the green shoots of recovery were beginning to emerge, Russia's war of aggression caused another shock, imposing a heavy price on the world.

The human costs and worsening impacts of this war are devastating, first and foremost, of course, on the people of Ukraine. But through its impact on the global economy, the lower growth, the higher inflation, the massive implications for energy and food security and affordability it is causing, this war is having a direct impact on countries all around the world. The disruptions to food and energy markets have exacerbated the supply-chain pressures building up from the Covid-19 pandemic. They have caused a

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global and broad-based surge in inflation, to levels not seen in 30 or 40 years in many countries. We now expect inflation in the G20 and the Euro Area to hit more than 8% in 2022 and still be above 6% in 2023, which is more than triple the pre-war projection for 2023 of 1.8%. Households and firms across the globe are suffering as costs rise and purchasing power is taking a hit. This inflation, and ongoing Covid-related supply-chain disruptions in China, have caused widespread weakness in manufacturing and services activity. Consumer confidence is at the lowest it has been for a long time. All of this will continue to weigh heavily on global growth, which we expect to be just 2.2% in 2023. And it threatens to unleash a food crisis while undermining progress on economic development in low-income countries.

This worsening outlook and heightened tensions are a serious threat to our rules-based international order. And these successive crises are putting pressure on citizens' trust in government. Mis- and dis-information, and loopholes in political finance frameworks, are being exploited by foreign actors. The global, rules-based trading system, a key foundation and driver of economic prosperity and growth, is facing unprecedented challenges.

Our first priority must be to get global growth back on track. An end to the war and a just peace for Ukraine would be the most impactful way to boost the global growth outlook right now. It would not only be good, self-evidently, for the people of Ukraine, who could start in earnest with their rebuilding and recovery effort; it would also be good for the people of Russia, for the global economy, and indeed for national economies and people all around the world. Until this happens, we need well-designed, well-coordinated policy responses to help mitigate the impacts of this war. We need to keep up the fight against inflation through well calibrated monetary policy, supported by equally well calibrated fiscal policy. Fiscal support to households and firms to cushion the impact of inflation should be well targeted and temporary. The supply of energy must be diversified – as Italy is increasingly doing – and demand side measures will also remain crucial. To boost global food security, we do indeed need to boost production through sustainable productivity growth, but as importantly we need to keep markets open to ensure that supplies can get to where they are most needed. Aid will need to be increased, and the openness of global food markets must be maintained to keep food affordable in low-income countries. We must avoid export restrictions, because they make a challenging situation even worse. And international cooperation must also be stepped up to minimize the potential adverse consequences of debt distress in low-income countries.

As we pursue urgent action to boost global growth, we must not lose sight of our medium- and longer-term structural reform missions. The effects of climate change, the uneven impacts of digitalization, declining trust in public institutions, shifting demographics and the pressures of a rising cost of living continue to pose challenges to our drive for healthy societies and inclusive economies, and for the democratic promise of social mobility and equality of opportunity.

While deeply challenging, it is exactly at times like these that we must maintain and build momentum to address our long-term objectives, including through shared action:

– on mitigating and adapting to climate change, while building climate resilience;
– toward seizing all of the many benefits of the digital transformation while better managing the risks associated with it;
– toward ensuring a global trading system in good working order;
– toward addressing the aging of our populations.

First, climate change. The economic consequences of the pandemic and Russia's war in Ukraine have seen our energy supply and security, and our energy affordability goals, collide with our green energy transition and climate-change mitigation objectives. We want to do it all, and indeed we must do it all – cushion the cost burden on vulnerable households and firms, shore up energy security and remain on track for carbon neutrality by 2050. With well thought-out, coordinated and comprehensive policy approaches, we can ensure that our short-term responses to current pressures do not divert us from achieving our important, longer-term net zero mission.

We need to reinforce, not undermine, the sustainable transformation of our economies. The good news is that so far, 139 countries around the world have committed to net-zero carbon emissions by 2050, or in the subsequent years – a number that continues to grow. However, we must translate commitments and the ambition of individual countries into globally effective action and outcomes.

The response to climate change requires globally effective solutions. Without proper global coordination of effort, action to reduce emissions in one jurisdiction may simply result in a shift of activity, jobs and emissions to another part of the world, which doesn't help the planet. To better coordinate our efforts, we need better, more comparable data and information on policy pathways to net zero and their impacts. We need better dialogue between advanced, emerging and developing economies. In June 2022, at

our annual Ministerial Council Meeting, chaired by Italy, we launched the OECD's Inclusive Forum on Carbon Mitigation Approaches. The Forum recognizes that different parts of the world, with different starting positions, in different circumstances and with different opportunities will inevitably use different policy approaches and policy mixes to make their best possible contribution towards global efforts to reduce emissions. Its objective is to take stock of the diverse range of carbon mitigation approaches across the world; to provide a platform to jointly improve the assessment and common understanding of different carbon mitigation approaches, their impacts and their comparative effectiveness; to learn from each other based on a data-driven, technical and objective analytical process; and ultimately to work together to avoid counterproductive negative spill-overs across borders that may result from uncoordinated action – such as the risk of carbon leakage.

As we step up our carbon mitigation efforts, we must also take action to adapt to our changing climate. The World Meteorological Organization reported an almost eightfold increase in average daily economic losses from extreme weather events over the past 50 years. OECD analysis has found that the proportion of our populations and economic assets being exposed to extreme weather events continues to increase. This is highly relevant for Italy, which already suffers from frequent extreme weather events, including both floods and droughts. The impact will be particularly devastating for low-income countries, particularly those that depend on agriculture, forestry or fishing. The OECD is leading work to help countries build their resilience in the wake of our changing climate. Through our International Programme for Action on Climate, we are providing data to help governments plan and implement effective policies for climate action.

And we also need to finance the transition. Current levels of climate and development finance are falling well short. The annual shortfall of funding to reach the Sustainable Development Goals has increased since the pandemic to 3.9 trillion US dollars per year. Governments cannot close this gap on their own. Public finances are under increasing strain from current economic conditions. Private sector financing will be crucial for our ability to fund the massive transformation needed to reach net zero. This will require governments to:
– use development finance to attract private sector investment to developing countries;
– reduce legal and regulatory barriers to private investment in their own jurisdictions;

   – develop harmonized metrics and interoperable standards, allowing investment projects to be assessed and readily compared.

The OECD is supporting these efforts with recommendations and tools on public procurement, infrastructure governance and investment quality.

It is very important as well for us to focus on the role of jobs and skills in the green transition. At least in the short run, the increasingly urgent and necessary green transformation will involve winners and losers. In fact, both the green and digital transitions risk creating new divides. New firms will emerge, some will adapt, others will close. This will involve significant labour market churn. The International Energy Agency projects a global net gain of 9 million jobs in energy supply alone by the end of this decade, but that is in aggregate. While job losses associated with decarbonisation may be small overall, they will be disproportionately larger in several sectors and regions and may affect public support for the transition. The net-zero transition will progress more quickly and more effectively if our citizens can see that achieving our climate goals is well aligned with their economic well-being. And in an era of tight labour markets and, in advanced economies, ageing populations, we need all of our human capital to be deployed to its best potential. Training will be key, especially for low-skilled workers who, across the OECD, are over three times less likely to participate in training than high-skilled adults. Upskilling and reskilling, active labour market policies, social dialogue and tailored regional economic development policies will therefore also be important enablers of an inclusive green transition.

Second, digital transformation. The benefits for growth, connectivity and innovation from digitalization are massive. Digital technology brings governments and citizens closer together, opens new economic opportunities, improves access to education, healthcare and other services, promotes transparency, and offers platforms for discussion and for dissent. Internet connectivity is now a necessity and a development goal. And of course digital technologies proved vital to maintaining economic activity, schooling and social connections during the pandemic. It prompted a wave of new innovation and accelerated the adoption of digital tools that remain in use, and will no doubt remain in use moving forward. However, the overall gains for growth and productivity have not yet been fully realized due to enduring digital divides. There are divides in access – in 2021, more than a third of the world's population, approximately 2.9 billion people, had never used the internet; divides between rural and urban areas – people in OECD metropolitan regions have broadband download speeds

that are on average 45% faster than remote regions; divides among income levels, since affordability remains a major barrier to access in many countries, amplifying economic marginalization; divides across gender – with women representing only 18% of executive leaders in artificial intelligence start-ups globally, for example; and divides across businesses – with many businesses being left behind while a small number of leading firms benefit the most.

Bridging these gaps will require policy action across a number of areas. Governments should invest in high-quality broadband access to open up opportunities for individuals and businesses, including entrepreneurs in rural communities. Regulatory reforms and effective competition law enforcement will also be crucial to ensure digital markets remain open, dynamic and competitive. New rules to promote digital interoperability and to tackle misconduct by leading digital firms have an important role to play. The European Union is leading the charge in this area with its own approach: the Digital Markets Act and the Digital Services Act. The Italian competition authority has also been particularly active in investigating potential anticompetitive conduct by digital players. Yet again, we must also ensure that citizens have the necessary skills to benefit from the transition, and to participate in all of the opportunities offered by the digital transition. Recent OECD research finds that a digital skills gap is holding back smaller firms in Italy from leveraging the digital transition.[3] Strengthening education, including enrolment in science, technology and engineering tertiary education, will be incredibly important. In Italy, 88% of people with tertiary qualifications in Information and Communication Technologies are employed, and yet this sector represents only 2% of new tertiary entrants.

The broad-reaching impacts of digitalization on our economy and societies mean that it can also be leveraged to tackle our common challenges. During the Covid-19 pandemic, digital technologies helped keep businesses and governments operating remotely. They also facilitated international mobility, allowing countries to implement testing and vaccine requirements as they reopened to foreign visitors.

There are also evolving risks and disruptions associated with digitalization that must be well managed: the need to effectively address issues related to cyber security, cyber-crimes, privacy,

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[3] OECD, *Closing the Italian digital gap. The role of skills, intangibles and policies*, March 15, 2022 (https://www.oecd-ilibrary.org/docserver/e33c281e-en.pdf?expires=1675714657&id=id&accname=guest&checksum=BA7F288D-B4EA11D9DEB55C811B3994E3).

competition policy, data free flow with trust, as well as the tax policy implications of the combined effects of digitalization and globalization. And while the digital transformation can help support the green transition, we must also recognize its large and growing carbon footprint. A single Bitcoin transaction in 2021 consumed the same level of carbon as a seat on a passenger flight from Amsterdam to New York. Digitalization also created significant challenges for taxation. In particular, it amplified the ability of large multinationals to take advantage of tax rules and earn significant income in market jurisdictions around the world without having to pay any, or only very little, corporate tax in those jurisdictions. The OECD helped broker a historic global agreement, which was formalized here in Rome at the G20 Leaders Summit in 2021, and which was joined by 137 countries and jurisdictions from around the world to help make the international tax system fairer and work better. It comprises two pillars: one to ensure a fairer distribution of multinational profits and taxing rights among countries, and a second pillar to ensure multinationals pay a minimum level of tax. Digital platforms are also being increasingly used as a vector for mis- and dis-information. During the Covid-19 pandemic, this phenomenon undermined government efforts to promote treatments and vaccination for their citizens. The challenge is to ensure that some of the checks and balances imposed in the physical world find appropriate application in the digital world.

Third, ensuring well-functioning markets, a global level playing field, and a rules-based global trading system in good working order. Open markets drive prosperity. They contribute to crisis response, as they did during the pandemic, when global supply chains rapidly scaled up production of protective equipment and vaccines. They will be necessary to avoid a food crisis, and respond to Russia's energy blackmail through diversification. And they will play a key role in the long-term sustainable transition of our economies. The massive effort to electrify our energy and transportation infrastructure will require copper, rare earths, and other materials, the supply of which is concentrated and therefore dependent on trade openness. Recent shocks have led governments to consider their supply chain vulnerabilities, and of course that is entirely appropriate. Efforts to reduce trade dependencies should be considered carefully, though, as they may introduce new vulnerabilities and risks. Policies that distort the level playing field, by favouring some firms over others, can sap productivity and undermine market dynamism. And fragmentation would be costly for all economies. The World Trade Organization (WTO)

has shown that a complete decoupling in the global economy would shrink Gross Domestic Product (GDP) by 5%. Instead, I would say that governments can enhance their resilience and diversify supply chains by leveraging competition and market openness. They can remove counterproductive trade and investment barriers. They can streamline regulations and eliminate regulatory barriers to competition. They can invest in digital and physical infrastructure to support trade. They can introduce investment-screening mechanisms to identify potential risks without undermining transparency, predictability or accountability in markets. And they can co-operate with like-minded countries to address the risks that economic dependence is used as a tool for coercion or blackmail. The OECD works with stakeholders to enhance supply chain resilience in a way that is aligned with WTO commitments, focusing on four keys: (i) anticipating risk, (ii) minimizing exposure, (iii) building trust, and (iv) keeping markets open. Strengthening supply-chain resilience can also support action on the other structural reform priorities I have mentioned. OECD guidance to policymakers and multinational enterprises on responsible business conduct is a good example. We help businesses better understand their supply chains and address adverse impacts from their operations on workers, human rights, the environment, bribery, consumers and corporate governance. By improving their knowledge of their supply chains, businesses can also identify key vulnerabilities that exist, and work with governments to address them.

Fourth, addressing population aging. The significant increase in life expectancy is one of the greatest achievements of the past half century, and overwhelmingly I'm sure we would all say is rather good news. When combined with low fertility rates, it has resulted in a rapid aging of populations across the OECD. In Italy, more than one-third of the population will be aged 65 and over by 2050. Population ageing is a drag on growth. All things being equal, it leads to lower workforce participation and consequently lower revenue for government. At the same time population ageing drives increases in public expenditure on pensions, health care and long-term aged care.

There are several tools available to governments to boost employment at older ages and to cushion the impacts of this trend. As we live longer we need to work longer. Later retirement should be rewarded and age-discriminatory policies and practices should be removed. Governments must improve the employability of workers throughout their working lives, including by addressing skill obsolescence among older adults. Strikingly, only 24% of

older adults participate in training compared to 47% of young adults in OECD countries. We really need to drive that cultural change towards lifelong learning.

Immigration is another potential tool. Between 2005 and 2015, immigration accounted for 91% of the labour force growth in the EU, 89% in Australia and 65% in the United States. In Italy, over the same period, the labour force would have declined without immigration. In recent years, large inflows of refugees from Afghanistan, Iraq, Syria and more recently Ukraine have contributed to population growth across Europe. However, international migration cannot offset the negative effects of population and labour force aging in the long term. Migrants eventually reach retirement age, too, and their effect on fertility rates is only temporary. So labour migration is best used as a tool for responding to specific labour demand in some sectors or occupations. And it will only be effective if new arrivals do not face structural barriers to full integration into society and the economy.

Boosting labour productivity – doing more with fewer workers – is another tool for grappling with the economic effects of an aging population. Governments need to address skills shortages by better strengthening access to vocational education and training, which reduces school drop-out rates and facilitates the school-to-work transition. Young people of all backgrounds and in all circumstances will need adequate access to education, work-based learning and career guidance to reach their full potential, and to help boost productivity. Beyond broad-based skills training policies, governments can make progress by closing the gap between the most productive firms and those with average levels of productivity. Our research suggests that workforce skills, managerial talent and diversity account for about one third of the productivity gap between these groups. In fact, more gender and culturally diverse firms are more productive. So integrating underrepresented groups such as immigrants and refugees into labour markets can pay not just social, but also economic dividends.

In closing, we face significant challenges from the short-term geopolitical and economic environment which require action, but we should not lose sight of our urgent structural reform agenda. Many elements of this reform agenda are mutually reinforcing. Digitalization can be harnessed to deploy effective climate solutions. Efforts to better understand the environmental impacts of our supply chains can uncover critical vulnerabilities. Digital adoption can help drive the productivity improvements needed to overcome our aging population-related challenges. There can also be tensions between these objectives, of course. However, the

policies needed to achieve them are all centered around open, dynamic markets, and ensuring that all citizens can benefit, and participate in, the ongoing societal transformations. And there is another common element: we cannot achieve these objectives on our own. No single country can achieve these objectives on its own. Our current challenges are an opportunity to strengthen co-operation rather than fragment it further. Multilateralism is critical to effectively respond to climate change, to address the taxation challenges from digitalization, to combat disinformation, and to protect the global level playing field. I know the Accademia is well aware of the value of multilateral co-operation, having hosted the Science20 meeting of national academies of science during Italy's recent G20 presidency.

As an institution founded in the aftermath of the World War II, the OECD is very much an embodiment of a previous generation's hopes for lasting peace and prosperity. Our broad global engagement, rooted in common values of democracy, rule of law, and open markets, helps provide the policy and analytical capability to tackle the shared challenges of the future. Pursuing new understandings and new solutions to these challenges is crucial, and so I thank you for the work you do at the Accademia.

Discussion [*]

Mathias Cormann, Julie Maxton,
Alberto Quadrio Curzio and Wolfango Plastino

Wolfango Plastino: *What should governments do to respond to the energy crisis?*

Mathias Cormann: That's obviously a very big question at the moment. I think it's appropriate that governments respond to the short-term pressure by seeking to cushion the impact in particular on low-income households, but also to try and cushion the short-term impact on the economy. From the point of view of the OECD, we believe that these measures should to the greatest extent possible be well-targeted, well-tailored, and temporary, and they should not detract from or undermine the incentives to consumers to lower their demand and to investors to help boost supply. To solve this challenge on an ongoing basis, it is obviously very important to use this crisis as the ground from which to accelerate the necessary green-energy transformation.

Ultimately, we need to boost supply in a sustainable and sustained fashion. Italy is very much engaged on that pathway of diversifying supply. We need to diversify supply with an eye on the continued mission, which is to reach carbon neutrality by mid-century.

Julie Maxton: I think the first thing to say is that there are slow-motion crises going on at the same time as the immediate energy crisis and other crises. These slow-motion crises I'm speaking of include climate change, in particular, and biodiversity loss. I think that governments can't take their eye off the ball, whilst they respond, as His Excellency says, to the immediate crisis, to helping households, which the British government has actually done. But more long term, we have to look for renewable

electricity, which we are doing, and the Royal Society has done some work on that. But there are some areas of commerce in particular, and shipping, aircraft and heavy road vehicles, where electricity is not going to be the solution in the short term. We're looking at hydrogen, synthetic fuels, and ammonia in those areas.

Also, we need to look at energy storage and electricity storage in the longer term; since we're not going to get to the point where CO_2 emissions can be eliminated in the short term, we have to look at carbon capture and storage as well. And finally, I would say we need to look at nuclear power. The Royal Society has done a report on nuclear cogeneration, and that is an avenue which not all countries agree with, as we know, but it generates low-carbon electricity, which is also consistent and reliable.

Alberto Quadrio Curzio: I am an economist, and I would like to spend some words on the OECD. The OECD is really a fundamental institution to understand how the governance of economies evolve over time. It is politically neutral, but scientifically totally reliable. So this is one of the most interesting experiments in economic sciences and multilateralism after World War II.

Having said that, I think that the title of the *Lectio Magistralis* of H.E. Mathias Cormann, "The Global Outlook: Short Term Pressures *vs* Structural Transformations and Reform", is in a certain way very important to show that the difficulties which we are living through today disprove the thesis of the "end of history". We have to look to structural reform for producing green growth and much more equality from the North to the South in the world.

Having said that, I want to point out two aspects which have to do mainly with the European Union (EU). The EU is a very big political and institutional setting in the world democracies. 27 countries collaborate with three different levels of government: the Parliament, the Council and the Commission. This implies a certain tiring decision-making process, but a democratic one, which is very important indeed. What happened during the energy crisis? I think that the EU reacted along three types of policies: first, short-term measures to protect mainly consumers and also businesses; income support to the weakest part of society with different kinds of aid has been rapid and effective. Then, in the medium-term, the EU kept decarbonization as its final and most important objective, but in this short period it also stressed other kinds of energy sources to avoid a collapse of the EU itself in its economy, but also its society. Returning to oil and other kinds of energy, which are not clean enough, is considered a momentary kind of intervention. Finally, for the long-term, we have to keep in mind that the six-year

plan of NextGenerationEU and the Recovery and Resilience Facility put one of the biggest parts of investment into energy transition. Taking into account the EU's 2021-2027 long-term budget and NextGenerationEU, more or less four-hundred billion euro are devoted to these transitions to clean energies.

I think that Europe is doing pretty well, even if, as I said before, its decision-making process is rather complicated.

Wolfango Plastino: The Green Transition is likely to produce winners and losers, at least in the short term. How should governments address these disparities?

Mathias Cormann: I think I addressed that in part in my remarks. It's inevitable; when you have structural transformation of this magnitude, structural transformation which is urgent and important, different parts of society will inevitably be impacted in different ways, and that is where public policy is very important: to correct any disproportionate adverse implications. I touched on the implications for the labour markets; you've got part of the economy working in carbon-intensive sectors, and generally speaking the age profile of that demographic is at the higher end, and some of the transitional measures will need to be very carefully targeted to help them transition from one reality to where we want to be, in a way that ultimately supports them through it. There are entire regions of the world that are more impacted by the necessary transitions than others, and we need to ensure that we have the level of structural transitional support that will help them get from the one reality to where we want to be. And so on and so forth.

Globally, too, different countries are in different positions, and some countries are better equipped to confront the challenges of the green energy transformation than others. When you look at the way some developing countries are impacted, and their comparatively much lower capacity to invest in the necessary measures to facilitate the best possible transition, developed countries obviously have an important responsibility to support developing economies in their transition. And developed economies have made a commitment to, for example, mobilize 100 billion US dollars a year in climate finance in support of that transition in developing economies. That was an objective which was meant to be reached in 2020; so far we are still falling short, and at this stage we will reach that objective in 2023. But there is still much more to be done even beyond that to ensure that the green transition can be effectively managed on a global level.

Ultimately, I think we need many more solutions-focused dialogues within countries and internationally, less politics perhaps and more of a pragmatic solutions focus, making sure that ultimately, nobody is left behind, and that the people that are most adversely affected by the necessary transitions receive appropriate levels of support to get them from one side to the other.

Julie Maxton: I think it's fair to say – and I think His Excellency has said it – that not all options are equal; many solutions are possible, and they won't play out fairly in all geographies. But I think there is a role for governments in investing in the science to move from where we are to where we are going to, and at the same time, I think there's a role for governments in bringing the public along with them, in understanding where we're going. The Royal Society put out a paper last year about moving to net zero, and it emphasized the science behind the move to the green transition. It also emphasized bringing the public along with the government, and thirdly also supporting low-income countries which will find it more difficult. There's a responsibility there, I think, in wealthy and wealthier nations.

Alberto Quadrio Curzio: I want to look now at the social problems, because one of the worries is that the split and the differences between poor, medium-income and high-income populations will increase dramatically. Also in Europe, where we have quite a lot of public aid given to the population, especially to the lower-income population, there is the danger of a kind of more dramatic splitting of societies. So we must be very careful to keep in mind that social cohesion remains fundamental for good development. Good development also means social cohesion.

With these points in mind, we have to consider the problem of employment, because employment is a fundamental way to guarantee also social cohesion. Europe is suffering because many of its industrial activities have another kind of difficulty: the automobile industry which is, especially in Germany, the core of the industrial system, is losing ground because there are shortages of fundamental components, which come from other countries – China, Taiwan, and Russia, too, with some kinds of raw materials. This causes another problem for Europe: how to make the industrial transition from, let us say, the old-style automobile industry, which is of course not electric, to a new kind of production. For the first time since the World War II, Germany, which has remained the strongest economy in Europe, is losing ground, especially because the big carmaker firms, and the automobile sector overall, is in a very, very dangerous crisis. So social and economic,

and especially industrial transitions are big problems for the EU. We need to consider social cohesion in this new revolution; this is not the Industrial Revolution, but the Technoscientific Revolution, which must always take into account the environment, and that's an important aspect for the future of Europe and the world.

Wolfango Plastino: *How is it possible to protect government tax revenues and address exploitation by multinational enterprises of gaps between different countries' tax systems?*

Mathias Cormann: That's what we've been working on now at the OECD for well over a decade, initially through our approach to working against base erosion and profit shifting, but also through our approach to improving the international exchange of financial information, removing bank secrecy, and making sure that tax authorities around the world have appropriate access to the information they need in order to enforce their domestic tax laws, and ultimately through our international tax reform deal, which was finalized and agreed on in October 2021. This seeks to reallocate taxing rights in relation to the activities and profits generated by 100 of the most successful multinationals globally, to ensure they pay their fair share of tax in the markets in which they operate and generate their profits, and also by putting in place a global minimum tax. That really removes the incentive for companies to base themselves in so-called tax havens, because to the extent that they haven't paid at least a 15% tax somewhere around the world on their combined profits, countries that are legislating to implement our international tax reform bill will be able to collect the gap between zero and 15% which hasn't been paid elsewhere.

It's a very serious challenge; it's one that's made harder by the combined effects of digitalization and globalization, and it is one that can only be effectively addressed through global cooperation; that is what we at the OECD very much seek to facilitate. In the end, governments around the world need to raise revenue in order to provide the essential public services that their citizens expect. They should raise that revenue in a way that is least distorting of the economy, that is least detracting from economic growth, but also in a way that is not just efficient, but also deemed to be equitable and fair. The situation as it was evolving, where local businesses only operating in a local market were subject to domestic tax laws, but businesses operating internationally were not subject to the same level of tax burden, is an obvious inequity and unfairness that needed to be addressed, and that will still need to be addressed

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more fully. This is very much one of those areas where we seek to add value in helping governments to protect their revenue base and to ensure that the international tax system is fair, avoiding non-taxation as well as double taxation.

Julie Maxton: Whilst the Royal Society has a vast range of expertise, tax policies is not one area that it's very big on. But I will say this: it's really important in this debate not to lose sight of the fact that the tax income needs to be invested, at least partially, in science, technology and innovation, because only if money is spent on science, technology and innovation, are we going to get growth, higher productivity, and new skills. The Royal Society has made this case in the UK very vigorously year on year, and in last week's budget, we had a commitment to hold to 20 billion over the next year. Our position – and many in this room know, and have helped us in this – is that we would like the closest possible association with Horizon Europe, and that is one area also where we contend that tax income should go to foster international collaboration. Science, as everybody here knows, is an international endeavor; it's not a nationalistic endeavor, and only with collaboration can we get better growth.

Alberto Quadrio Curzio: I think that the OECD and G20 economies, or G20 states, have done quite a lot of work to put together an action plan to address the gaps in the international tax system. The Multilateral Convention carries that measure; its objectives are implemented through a tax treaty to prevent base erosion and profit shifting from one country to another country. The OECD has done quite a lot, and I think that in the end it will succeed in finding a solution to the problem of tax evasion.

Having said that, I would like to point out also that many, many firms, both big and small, have a code of corporate social responsibilities, and also a code of green investment. I think it's important, too, in all these rules, to avoid tax erosion and also to provide certificates for corporate social responsibilities, and that green activities inside the firm are connected and have a very important role indeed.

Wolfango Plastino: *What is the role of international organizations in contributing to the recovery and the reconstruction of Ukraine?*

Mathias Cormann: In relation to Ukraine, the topic of the day is also very relevant. There are the short-term pressures and then

there is the longer-term reform, rebuilding and reconstruction focus as an imperative. In the short term, self-evidently the first priority is to secure a just peace for Ukraine. Right now, there is a really important focus on Ukraine's immediate financial needs, on ensuring its macro-financial stability. And in the context of serious and intensifying attacks on energy infrastructure, there is a real short-term need to keep the lights on, to keep people in safe housing, and indeed with access to water and public services.

But we are of course thinking beyond. We are working with the government of Ukraine as an organization, and with partners in Europe and internationally, on how to best advance the rebuilding, reconstruction and reform efforts on the other side. It is very important that we start planning on this now, and there are a lot of organizations, a lot of countries, a lot of jurisdictions that are very motivated and that want to help. It's important for Ukraine and the democratically elected government of Ukraine to have full ownership of that process for countries and international organizations and institutions to coordinate very well with each other, for each to deploy what they're best at, their core capabilities. From the OECD's point of view, our core capability really is to provide policy-guidance based on evidence-based best practice, and also to support Ukraine as we have in the past, and as we have with Central-Eastern European countries in the post-Soviet era, to help with capacity and institutional capacity-building and the like.

Right now, there is a war going on. Clearly, a just peace as soon as possible, supporting macro-financial stability and access and reliability of basic services all the way through, thinking about how we can best organize the rebuilding and recovery effort on the other side, making sure there is an inclusive international platform to really channel and well-coordinate that support – all of this, I think, is going to be very important.

Julie Maxton: I agree. I think there's a huge role for international organizations to come together and do a kind of Marshall Plan as there was after the World War II for Ukraine, and clearly that needs to happen, as soon as there's a just peace, as His Excellency says. On a more local level, the Royal Society has been working with other academies, in particular the Polish Academy and the National Academy of Sciences in the United States, to help Ukrainian scientists to work, either close to home in Poland or in other countries close to Ukraine, or in the UK, or further afield, and also we've been making access to scholarly journals available for free and taking other measures to help the scientists.

But clearly it will require a big international effort to get Ukraine back on its feet after this.

Alberto Quadrio Curzio: I think that the reconstruction, the re-building of Ukraine should be governed by multilateral institu-tions. As far as the status of OECD allows, the OECD should have a very important role for protection, control, and reforms, in Ukraine's rebuilding. Secondly, we have to consider that there is the European Bank for Reconstruction and Development (EBRD), which was founded in 1991 by François Mitterrand and Helmut Kohl in order to help the transition of the Soviet economies – sat-ellite states, not the Russian one – to the free-market system. The EBRD is rather capable now, in these days, of helping reconstruc-tion of Ukraine, even if it is lacking in capital for such a big job.

Finally, I think that the World Bank also has to be involved. So I see three institutions which should govern Ukraine's rebuilding: the OECD, the EBRD and the World Bank. I believe that the contribution of single countries will be important, but it has to be realized under the supervision and the planning of these three kinds of multilateral institutions.

Wolfango Plastino: *How do you think artificial intelligence (AI) will reshape our economies, and do you think policy-makers are pre-pared to respond to rapid developments in technology?*

Mathias Cormann: AI is already rapidly reshaping our econo-mies, and it has many very positive benefits. Some of them, like helping us with our movie selection, might not on the face of it seem to be as important as others, but then there are others, all the way through healthcare and the way we may be able to better, more effectively respond to climate change. There's a broad spectrum. The challenge is that, because these technologies are developing so rapidly, it's going to be difficult for regulators to stay, not on top of the technology per se, but in touch with where the regulatory framework needs to be. You want to ensure that we have a human-centric use of AI in a way that is consistent with our values, but by the same token you don't want to be so burdensome with your reg-ulatory framework that you end up stifling innovation. Not that you would necessarily be able to stop innovation that way anyway.

This is a really challenging area to get the balance right, and it is also one where we really do need effective international co-op-eration to make sure we can optimize all the undoubted benefits that come from AI while making sure that we protect ourselves to

the extent necessary from some of the downside risks. That is a policy space that is very alive as we speak at the moment; it is probably one where it is going to be important for governments to acquire some of the skills to really be able to do their job in a way that is as intelligent as we need it to be.

Julie Maxton: I think that particularly in healthcare there are great opportunities for AI. Many people know that scans of whatever part of the body can be read really well and can be very accurate. But there also areas where humans have a part to play, and I think it's important that policymakers remember that there's a balance between the two aspects – between the increased artificial intelligence and the necessity for human interventions.

It's particularly important in preserving privacy. I think the lack of privacy which comes from some developments in automation and technical advances everybody knows about; but how do we preserve privacy? I think that's a big area for policymakers.

Finally, I think that machines don't always work correctly. We've seen cases in the law courts in the UK where big systems – bank systems – have made mistakes and the assumption has been that the system works, but the assumption is wrong. So I think we need to be sceptical, and we need to remember that machines don't always get it right.

Alberto Quadrio Curzio: In November 2022, there was one of the biggest bankruptcies of a cryptocurrency company ever (that of FTX) – a bankruptcy of many, many millions of dollars, maybe billions of dollars. There is danger in the stock exchange and any financial relationship if we don't have human control through rules, rules which must be elaborated and must be applied. Otherwise, from the financial point of view, all algorithms might be distorted to negative uses. So, we must be very careful. I agree that in healthcare AI might be fundamental, but in the financial market, I don't believe that we can forget rules and controls.

APPENDIX

Special Events of the
Colloquia on Science Diplomacy

MMXXII

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LEONARDO DA VINCI, CODEX ATLANTICUS (1494)

HONORARY COMMITTEE
Roberto Antonelli, Elisabetta Belloni, Lamberto Maffei, Giorgio Parisi,
Alberto Quadrio Curzio, Ettore Francesco Sequi and Pasquale Terracciano

Chair
Wolfango Plastino

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LEONARDO DA VINCI, CODEX ATLANTICUS (1494)

SPECIAL EVENT
with

H.E. Ahmed Aboul Gheit

PROGRAMME

2 March 2022, 4:00pm

Welcome addresses	**Prof. Roberto Antonelli** *President of the Accademia Nazionale dei Lincei*
	H.E. Amb. Pasquale Ferrara *Director General for Political and Security Affairs of the Ministry of Foreign Affairs and International Cooperation*
Lectio Magistralis	**"The Arab World in a Changing International Order"**
	H.E. Ahmed Aboul Gheit *Secretary-General of the League of Arab States*
Roundtable	**moderated by Prof. Wolfango Plastino** *Chair of the* Colloquia *on Science Diplomacy*
	H.E. Ahmed Aboul Gheit *Secretary-General of the League of Arab States*
	Prof. Sabah Al Momin *Vice President of The World Academy of Sciences*
	Prof. Alberto Quadrio Curzio *President Emeritus of the Accademia Nazionale dei Lincei*

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ACCADEMIA NAZIONALE DEI LINCEI

Colloquia on Science Diplomacy

MMXXII

SPECIAL EVENT
with

H.E. Petteri Taalas

PROGRAMME

11 April 2022, 4:00pm

Welcome addresses	**Prof. Roberto Antonelli,** *President of the Accademia Nazionale dei Lincei*
	H.E. Plen. Min. Giampaolo Cutillo *Vice Director General for Global Affairs of the Ministry of Foreign Affairs and International Cooperation*
Lectio Magistralis	**"Climate Change: Impacts and Mitigation/ Adaptation Perspectives"**
	H.E. Petteri Taalas *WMO* Secretary-General*
Roundtable	**moderated by Prof. Wolfango Plastino** *Chair of the* Colloquia *on Science Diplomacy*
	H.E. Petteri Taalas *WMO Secretary-General*
	Prof. John Shine *President of the Australian Academy of Science (Australia)*
	Prof. Giorgio Parisi *Vice President and Past President of the Accademia Nazionale dei Lincei and Physics Nobel Laureate*

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* World Meteorological Organization of the United Nations

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SPECIAL EVENT

with

H.E. Izumi Nakamitsu

PROGRAMME

15 June 2022, 4:00pm

Welcome addresses — **Prof. Roberto Antonelli**
President of the Accademia Nazionale dei Lincei

H.E. Plen. Min. Carlo Lo Cascio
Deputy Secretary-General of the Ministry of Foreign Affairs
and International Cooperation

Lectio Magistralis — **"Global Security and Disarmament Agenda
at Crossroads: A Fragmented World or a
Cohesive Future?"**

H.E. Izumi Nakamitsu
UN Under-Secretary-General and High Representative for
Disarmament Affairs*

Roundtable — **moderated by Prof. Wolfango Plastino**
Chair of the Colloquia *on Science Diplomacy*

H.E. Izumi Nakamitsu
*Under-Secretary-General of the UN and High Representative
for Disarmament Affairs*

Prof. Marie-Louise Nosch
*President of the Royal Danish Academy of Sciences and Letters
(Denmark)*

Prof. Giorgio Parisi
*Vice President and Past President of the Accademia Nazionale
dei Lincei and Physics Nobel Laureate*

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* United Nations, *Nobel Peace Prize 2001*

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Colloquia on Science Diplomacy

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LEONARDO DA VINCI, CODEX ATLANTICUS (1494)

SPECIAL EVENT
with

H.E. António Vitorino

PROGRAMME

27 September 2022, 4:00pm

Welcome addresses	**Prof. Roberto Antonelli** *President of the Accademia Nazionale dei Lincei*
	H.E. Plen. Min. Luigi Maria Vignali *Director General for Migration Policies of the Ministry of Foreign Affairs and International Cooperation*
Lectio Magistralis	**"Migration in the Post-Pandemic World"**
	H.E. António Vitorino *IOM* Director General*
Roundtable	moderated by **Prof. Wolfango Plastino** *Chair of the* Colloquia *on Science Diplomacy*
	H.E. António Vitorino *IOM Director General*
	Prof. José Luís Cardoso *President of the Academy of Sciences (Portugal)*
	Prof. Giorgio Parisi *Vice President and Past President of the Accademia Nazionale dei Lincei and Physics Nobel Laureate*

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* United Nations International Organization for Migration

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Colloquia on Science Diplomacy

MMXXII

LEONARDO DA VINCI, CODEX ATLANTICUS (1494)

SPECIAL EVENT

with

H.E. Mathias Cormann

PROGRAMME

21 November 2022, 4:00pm

Welcome addresses	**Prof. Roberto Antonelli** *President of the Accademia Nazionale dei Lincei*
	H.E. Amb. Ettore Francesco Sequi *Secretary-General of the Ministry of Foreign Affairs and International Cooperation*
Lectio Magistralis	**"The Global Outlook: Short Term Pressures *vs* Structural Transformations and Reform"** **H.E. Mathias Cormann** *OECD* Secretary-General*
Roundtable	**moderated by Prof. Wolfango Plastino** *Chair of the* Colloquia *on Science Diplomacy*
	H.E. Mathias Cormann *OECD Secretary-General*
	Prof. Julie Maxton *Executive Director of The Royal Society (United Kingdom)*
	Prof. Alberto Quadrio Curzio *President Emeritus of the Accademia Nazionale dei Lincei*

VENUE

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* Organisation for Economic Co-operation and Development