


## Technology and Global Change

# The Failure of Constructive Collective Action When We Need It Most

Seán M. Cleary<sup>1,2</sup> 

<sup>1</sup> FutureWorld Foundation, Zürich, Switzerland, <sup>2</sup> Parmenides Foundation, Pöcking, Germany

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## Global Perspectives

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The war in Ukraine, after President Putin's invasion on 24 February 2022, violated Article 2 of the UN Charter, as well as preemptory rules of public international law. It also represents a failure by the states and international organizations that opposed Mr. Putin's illegal act to deter the invasion and to meet their "responsibility to protect" Ukrainian civilians and civilian infrastructure after the invasion. It exposed our collective inability to manage complex circumstances to avert tragedy in a highly connected world. The reasons are clear: overconfidence bordering on hubris in the West in the aftermath of the collapse of the USSR in 1991, and neglect of the need to construct a viable security architecture in Europe, coupled with Mr. Putin's revanchism and nationalistic hubris. Meanwhile, in October 2023, the United States was confronted with a second major war in the Middle East after Hamas breached the border with Israel on 7 October, and Israel counterattacked in force. The costs of a failure to construct the "two-state solution" to the Israel and Palestine conflict were highlighted again. Washington and its allies also risk "sleepwalking" into a similar unintended conflict with China through a series of reciprocal miscalculations.

Our limited cognitive capability to address the challenges posed by the workings of complex systems and our reliance on linear, logical processes to devise policies, which are often distorted by fear and ambition in their execution, are inadequate in the context of complexity. *The illusion of control* of future circumstances that afflicts governance at all scales, sharpening conflict and fracturing even relatively mature national societies, is particularly dangerous in the context of the deep global connectivity effected in the past three decades. The asymmetry of a highly connected global economy and a deeply fractured global society has exposed the dysfunctionality of our international policy, triggering a *symmetry break* in the *international rules-based order*, and tipping the world system into a new meta-stable state in which the "West" is increasingly pitted against the "Global South." Reconfiguration, based on humility and reflection, is urgently needed.

### THE LIMITATIONS (OR ABSENCE) OF CONTROL

In the synopsis for "The Illusion of Control," Jan Vabinder wrote:

As the collective human impact [on the Earth system] becomes more visible, it becomes ... clear that we humans (as individuals, organizations, or governments), have no control over the consequences of the change of context that we initiate(d) over time. Our control is illusion. ... our illusions are in control... creat[ing] patterns of thought that entice us to believe that we can control the emergence of our future. It is time to think about our future as a context over the emergence of which we cannot have control.

His thesis is correct, for three reasons: the inherent character of complex systems (Lansing 2003); the limitations of human cognition (Cleary 2009); and the inadequacy of the instruments available for policymaking, legislation, and execution in our national (Cleary 2020) and international (Cleary 2017) systems of governance.

While the implications of this must be explored more generally (Yarhi-Milo 2023), the war in Ukraine and its origins and potential consequences provide an illustration of the truth of the statement, allowing one to reflect on the caution that it must prompt.

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a Correspondence: [sean.cleary@futureworldfoundation.org](mailto:sean.cleary@futureworldfoundation.org)

## THE WAR IN UKRAINE

The international system between 1945 and 1991 was a bipolar order centered on Washington and Moscow. Decolonization since 1947 led to growth of the *international community*, with membership of the United Nations rising to 193 states, an almost fourfold increase since 1945 ([United Nations](#)). Multilateral management of global affairs, with the United Nations supported by the IMF, the World Bank Group, the GATT/WTO, and a host of UN funds, programs, and specialized agencies ([United Nations funds programs and agencies](#)) enabled economic advances.

After the USSR's collapse in 1991, the United States exercised hegemony across most of the world in a rules-based international system of its design. This enabled economic and social progress in a global economy and society, premised on the UN Charter. But the digitization of connections, the globalization of finance, and the construction of integrated supply chains weakened governments as liberalized capital flows, increasing financialization, offshoring, and the displacement of jobs posed growing challenges to state capacity (Rodrik 2007).

The past two and a half decades of the *digital era* have brought challenges akin to those wrought in Europe when the Industrial Revolution replaced kinship with class as the primary social building block, and industry supplanted agriculture and craft manufacturing as the leading means of adding economic value. A more deeply integrated global economy outstripped the ability of a global polity to deliver the public goods that markets cannot provide. Without agreement on the norms (Cleary 2011) that would underpin a new polity, we have been unable to create one. There is no global *community*. The asymmetry between the global economy, society, and polity have led to weak economic governance, social volatility, normative clashes, and geopolitical turbulence.

Progressive economic integration has constrained the capacity of states to secure civic well-being, weakening trust in institutions (Edelman Trust Barometer 2023). Civic disaffection led many to defect from voting (EIU Report, n.d.). Party membership has fallen, while the “third wave” of democratization in Africa, Eastern Europe, Asia, and Latin America between 1975 and 2005 has regressed. Social media have transformed social and political landscapes, trapping citizens in echo chambers defined by exclusive assertions of truth, undermining civil discourse, and driving political polarization (Garimella et al. 2018). Governments are struggling to adapt.

This poses two sets of problems. First, most forms of transnational collective action are weaker. No shared concept of a future global order has emerged from the G7, the G20, or the United Nations since the Paris Agreement on Climate Change ([United Nations 2015](#)) and Agenda 2030 ([UN DESA](#)) in 2015. Despite the need for a shared vision and coherent collective action to achieve it, the divergent cultural preferences of elites and the rhetoric of populists are frustrating its realization. In these circumstances, *control is an illusion*.

The interplay between geo-economic trends, geopolitical tensions, and social inequality, exacerbated by a *bio-digital technological revolution*, has fractured national societies, weakened representative democracy, and undermined collective action on security, health, climate, oceans, and biodiversity.

By the second decade of the twenty-first century, eight interacting elements of change were shaping the global system.

- A shifting center of economic gravity—from the Atlantic to the Indo-Pacific
- The weakening of US power projection after long conflicts in Afghanistan and Iraq
- Disruption of the (previous) rules-based international order as rising powers challenge US precepts
- Geopolitical tensions and contestation of regional security landscapes
  - From the Eastern Mediterranean to Central Asia
  - In the Russian “near abroad”; and
  - On the maritime periphery of the People’s Republic of China
- The first *post-industrial, bio-digital, technological revolution*—conflating rapid development of info-, bio-, nano-, and neuro-technologies
- Significant social disruption within national societies
- Weakening national governance, notably in democratic polities, and
- System-wide stresses due to the impacts of a growing, rapidly urbanizing human population on the Earth system

By 2021, there was a growing risk that the conflation of a global pandemic; a deep economic crisis combining supply, demand, and financial shocks; widespread social disruption; coarsened political discourse; and contestation between the United States and China on trade, technology, and national security, in the context of debilitated global institutions and a weakened normative framework, had put the world at risk of “sleepwalking” into disaster (Clark 2012).

The interaction of these eight trends suggested three scenarios: **Islands**, **Archipelagos**, and **Constructive Equilibrium**. In summary, **Islands** was defined as:

A G2 world in which Washington and Beijing pursue competitive security and mercantilist policies with little cooperation. ... Most other states ... suffer neglect of their interests, and [are] ... forced into making choices between alliances with either the U.S. or China. Russia ... benefit[s] in the immediate term, leveraging its relationship with China, and extending control of its neighbourhood, but the limits of this ... soon become clear. ... Trade in goods and services and foreign investment [are] ... constrained, negatively impacting on growth, and tipping the world into ... [a] deep recession. ... Although the price of renewable energy sources ... has fallen below that of fossil fuels, the deep decarbonisation needed to avert climate catastrophes [is] not ... undertaken .... Destructive competition, tipping into conflict, will deny the world its opportunity to

recover economically, if staying within the window of 1.5°C [and quite possibly 2°C] warming. (Cleary 2021)

Mr. Putin beat Beijing and Washington to the punch on 24 February 2022, after a series of gross miscalculations, believing that the threat of his applying superior military force against Ukraine, while Russia controlled much of Europe's gas supply and a share of its oil, would allow him to pressure the United States and NATO to accept his proposals on reconfiguring the *European security architecture*.

## ORIGINS OF THE CRISIS

In his address at the Munich Security Conference in 2007, Mr. Putin castigated the “unipolar world” that had emerged after 1991:

a world in which there is one master, one sovereign... pernicious not only for all those within this system, but also for the sovereign itself because it destroys itself from within. It has nothing in common with democracy. ... the unipolar model is not only unacceptable but also impossible in today's world.... (Putin 2007)

Mr. Putin's statements after becoming president indicated three strategic objectives for Russia: (1) continued nuclear parity with the United States; (2) acceptance as a “great power” whose views on any matter of vital interest to Russia would be accommodated by other “great powers”; and (3) effective control of the Russian “near abroad.” After his address at the Munich Security Conference in 2007, he moved on Georgia in 2008 (Dickinson 2021), and on Ukraine in 2014 (Mykhnenko 2022), recovering Crimea and disrupting the Donbas.

President Putin's unease was driven by the dissolution of the Warsaw Pact, which radically transformed the security environment in central Europe.

As former NATO secretary-general, Javier Solana, observed in 2022:

The rearrangement of the post-Soviet space was particularly disruptive for Russian foreign policy, which has a territorial conception of power. The progressive reduction of Russia's territorial buffer—formed by countries over which it exerted powerful influence or outright control—left the Kremlin feeling cornered. Against this backdrop, the prospect of losing Ukraine is even more unacceptable than a unipolar world order—which explains Russia's massive deployment of troops along the country's long border. ... the Kremlin is clearly committed to keeping Ukraine within its sphere of influence. (Solana 2022)

Russia's “territorial conception of power” flows from its location on the eastern verge of the European Plain, which sweeps from the Pyrenees across northern Europe to the Urals, widening from some 320 km in western Europe to more than 3,200 km in western Russia, creating an acute sense of vulnerability to invasion: Napoleon advanced across the plain to Moscow in 1812, as did Hitler in 1941 (Royde-Smith, n.d.).

In response, Stalin annexed eastern Poland in September 1939, and the Baltic states in 1940. After the defeat of Nazi Germany in 1945, in September 1947 he gathered delegates from the Communist Parties of the USSR, Poland, Yugoslavia, Bulgaria, Romania, Hungary, Czechoslovakia, Italy, and France in Belgrade to create the Cominform. Within a year, the USSR had established people's democracies ruled by Communist Parties in Poland, Hungary, Romania, and Czechoslovakia. The Yugoslav Communists broke with the Cominform in 1948.

The North Atlantic Treaty Organization (NATO) was created on 4 April 1949 with twelve members—Belgium, Britain, Canada, Denmark, France, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, and the United States ([NATO Founding Treaty 1949](#)). Greece and Turkey were admitted in 1952. A week after NATO's decision to admit the Federal Republic of Germany (FRG) on 6 May 1955, the USSR created the Warsaw Pact, comprising the Soviet Union, Albania, Poland, Romania, Hungary, East Germany, Czechoslovakia, and Bulgaria, requiring all members to defend any attacked by an outside force ([Warsaw Pact](#)). In 1982, Spain joined NATO, sixteen years after France had withdrawn from military participation in the alliance, returning only in 1995.

President George H. W. Bush's secretary of state James Baker records that USSR foreign minister Shevardnadze proposed in September 1990 that the United States should dissolve NATO, as Moscow had dissolved the Warsaw Pact (Baker 1995). Earlier, in February 1990, President Gorbachev had said, “Certainly any expansion of the zone of NATO is unacceptable,” adding: “I believe the presence of U.S. troops would be very constructive... We ... don't want to see a replay of Versailles, where the Germans were able to arm themselves. ... Germany must stay within European structures.”

While Shevardnadze's proposal to dissolve NATO was rejected by Washington, it understood Moscow's concerns about Germany. Protracted negotiations followed. On 6 March 1990, Gorbachev had said that the USSR opposed the participation of “a united Germany” in NATO: “We cannot agree to that. It is absolutely ruled out.” On 8 March, Shevardnadze said that the inclusion of Germany in NATO would be inconsistent with Russia's “own national interests and the security structure of the Common European Home” (Baker 1995).

On 31 May 1990, Gorbachev, meeting with Bush in Washington, argued that a united Germany could be either a member of NATO and the Warsaw Pact, or a member of neither. Alternatively, he suggested that as “Stalin, Roosevelt and Churchill... had been one coalition,” perhaps the USSR could join NATO. Later, however, he agreed that Germany should be able to decide whether to join NATO or the Warsaw Pact (Baker 1995).

Gorbachev's overriding ambition was to create a “common European home.” Addressing the Parliamentary Assembly of the Council of Europe on 6 July 1989, he quoted Victor Hugo, who had suggested that “all the nations of the continent—will... merge inseparably into some high society and form a European brotherhood.” Gorbachev argued

that “... European unification should be ... [reconsidered],” and that “[d]ifferences between states ... are even salutary, ... provided... that the competition between different types of society is aimed at creating better material and spiritual conditions of life for people.” He called on all to “consign to oblivion the Cold War postulates [of a ] ... Europe... divided into “spheres of influence” and ... “forward-based defenses,” as in an interdependent world, these geopolitical notions were “as useless as the laws of classical mechanics in quantum theory” (Gorbachev 1989).

Gorbachev spoke similarly when accepting the Nobel Peace Prize in 1990, citing Kant’s assertion that mankind would have to choose between joining in a true union of nations or perishing in a war of annihilation. He said that the USSR would strive for a future based on “openness, mutual trust, international law and universal values [in which] ... Europe would come to be ... an example of universal security and genuine cooperation” (Gorbachev, n.d.).

This was not realized. In 1997, NATO Secretary-General Solana negotiated the Founding Act on Mutual Relations, Cooperation, and Security between NATO and the Russian Federation, with Russia’s Foreign Minister Primakov, and signed it with President Yeltsin. Kremlin spokesman Sergei Yastrzhembsky said that NATO’s expansion “at the expense of post-Soviet space, including the three Baltic republics,” would be “unacceptable” for Russia. President Yeltsin said, “if NATO begins to take decisions without taking account of Russia’s opinion, Russia will review its relation[s] with the Alliance” (Fossato 1997).

Mr. Putin’s belief that the NATO expansion represented a threat to Russia thus had a long history. Gorbachev’s vision of a “common European home” had come to nought. NATO had expanded toward the Russian Federation, expanding the Western sphere of influence.

There were negotiations on a European security treaty. In 2009, the Russian draft of the treaty provided at articles 1 and 2 that “the Parties shall cooperate with each other on the basis of the principles of indivisible, equal and undiminished security. Any security measures taken by a Party to the Treaty ... shall be implemented with due regard to security interest of all other parties... to strengthen security of each other” and “A Party to the Treaty which is a member of military alliances, coalitions or organizations shall seek to ensure that such alliances, coalitions or organizations observe principles set forth in the Charter of the United Nations, Declaration on principles of international law concerning friendly relations and cooperation among states in accordance with the Charter of the United Nations, the Helsinki Final Act, the Charter for European Security and other documents adopted by the Organization for security and cooperation in Europe, as well as article 1 of this Treaty, and that decisions taken in the framework of such alliances, coalitions or organizations do not affect significantly security of any Party or Parties to the Treaty” ([European Security Treaty 2009](#)).

Russia’s proposals on “indivisible ... security” in the negotiations on a European security treaty in 2009 were thus consistent with those it put to the United States and NATO on 15 December 2021, according to the Arms Control Association’s summary of the Russian proposals, and the US and NATO responses on 25 January 2022 (Arms Control Association 2022). Two provisions of the Russian proposals of 15 December 2021 should be noted:

Parties shall not deploy ground-launched, intermediate- and short-range missiles either outside their national territories or inside their national territories from which the missiles can strike the national territory of the other party.  
Parties shall not deploy nuclear weapons outside their national territories and shall destroy all existing infrastructure for deployment of nuclear weapons outside of their national territories.

These go to a disagreement about US Aegis Ashore batteries in Poland and Romania—radar-guided, interceptor MK4I antiballistic missile systems. In December 2021, Mr. Putin said: “Are we deploying missiles near the U.S. border? No, we are not. It is the United States that has come to our home with its missiles and is ... standing at our doorstep.” The Kremlin regards US missile defense capabilities in Eastern Europe as a threat to Russia’s nuclear arsenal, the guarantee of its great power status. The possibility that the United States could shoot down Russian missiles undermines the premise of *mutually assured destruction*, deterring a nuclear war between the superpowers.

In 1972, the USSR and the United States agreed to the Antiballistic Missile (ABM) Treaty to preserve mutual vulnerability in nuclear exchanges. In December 2001, President George W. Bush withdrew from the ABM Treaty and directed the Pentagon to build a system to protect the United States and its allies from the threat of missiles from Iran. Thomas Graham, senior director for Russia in Mr. Bush’s National Security Council, said Moscow never accepted that the new ABM system was directed against Iran, believing it was deployed to shift the balance of power vis-à-vis Russia (Graham 2022). “The current crisis is really much broader than Ukraine,” Mr. Graham said. “Ukraine is a leverage point, but it is more about Poland, Romania, and the Baltics. The Russians think it is time to revise the post-Cold War settlement in Europe in their favor.”

Mr. Putin has cited US withdrawal from the ABM Treaty as evidence of Washington’s disregard of Russia’s interests. “We tried for a long time to persuade our partners not to do this,” Mr. Putin said in February 2022. “Nevertheless, the U.S. did what it did— withdrew from the Treaty. Now antiballistic missile launchers are deployed in Romania and are being set up in Poland.” If Ukraine drew closer to NATO, he said, “it will be filled with weapons. Modern offensive weapons will be deployed on [Ukraine’s] territory just like in Poland and Romania.”

The Aegis Ashore site in Romania has operated since 2016, but Moscow viewed the facility at Ridzik in Poland as a greater threat. It is 160 km from the Russian border and 1,250 km from Moscow, installed in 2021, becoming operational by the end of 2022, Rear Admiral Tom Duggan said in November 2021, adding: “It is specifically not focused on threats out of Russia, despite what they say” (Lopez 2021). As Mr. Graham has noted, the Kremlin rejects that assurance (Higgins 2022).



## THE PRESENT CRISIS

The core of Moscow's proposals of 15 December 2021 was not negotiable. Then-US ambassador John Sullivan said that "... *the Russians were going through the motions.... There was no engagement. ... There was ... no variance from the talking points*" (Mackinnon and Gramer 2023). Mr. Putin had set out his preconditions for peace in mid-December. He repeated them on 23 February 2022 after the United States and NATO had sidestepped them on 25 January: first, international recognition of Russia's claims to Crimea and Sevastopol; second, Ukraine's abandonment of any plan to join NATO; third, the "... demilitarization of the modern Ukraine," with the West stopping weapons transfers to Kiev.

On 21 February 2022, Mr. Putin argued that Ukraine was under the control of the West, that the Ukrainian military strategy of March 2021 was "almost entirely dedicated to confrontation with Russia and sets the goal of involving foreign states in a conflict with our country." He continued: "The strategy stipulates the organisation of ... a terrorist underground movement in Russia's Crimea and in Donbass. It also sets out the contours of a potential war, which should end, according to the Kiev strategists, 'with the assistance of the international community on favourable terms for Ukraine,' and ... 'foreign military support in the geopolitical confrontation with the Russian Federation. In fact, this is nothing other than preparation for hostilities against our country, Russia'" (Putin 2022).

Meanwhile, Mr. Putin's article "On the Historical Unity of Russians and Ukrainians," of 12 July 2021, signaled his intent to neutralize Ukraine and incorporate Donetsk and Luhansk, primarily Russian-speaking areas, and Ukraine's Black Sea coast into Russia (Putin 2021).

In a survey in 2014, asking about the preferred future orientation of Ukraine, 82 percent of Ukrainians in the west, 59 percent of those in the center, 50 percent of those in the north, but only 16 percent in the east and 27 percent in the south favored orientation toward the European Union. Forty-six percent of those in the east and 24 percent of those in the south were in favor of orientation toward Russia, with another 26 percent in the east and 28 percent in the south favoring orientation toward both. This shows the divisions in Ukraine at that time.

Only 21 percent of Ukrainians believed that Russia treated Ukraine with respect, however, while 53 percent believed that it sought to impose Russia's culture on others, with 71 percent believing that Moscow interfered in the affairs of others for its economic benefit (IFES 2014).

In January 2023, eleven months after the invasion, Russian collaborators were still active throughout Ukraine, in the Orthodox Church, chambers of commerce, and government agencies. Loyalties are still divided, even if Russia's brutality during the invasion has strengthened the determination of most citizens to consolidate a Ukrainian identity (Glinski 2023).

On 18 January 2023, Mr. Putin said that Moscow's invasion was intended to "stop a war" that had raged in eastern Ukraine for many years. He said that Moscow had sought to negotiate a settlement in the Donbas since 2014. "Large-

scale combat operations involving heavy weapons, artillery, tanks and aircraft haven't stopped in Donbas since 2014," he said. "All that we are doing today as part of the *special military operation* is an attempt to stop this war. This is the meaning of our operation—protecting people who live on those territories." Mr. Putin insisted that Russia tried to negotiate a peaceful settlement to the conflict before sending in troops, but "we were just duped and cheated." He described Ukraine's east as Russia's "historic territories," adding that Moscow conceded their loss after the 1991 collapse of the Soviet Union, but had to act to protect Russian speakers there (Associated Press 2023).

## TAKING STOCK

Nothing in the divided cultural-linguistic character of Ukraine excuses President Putin for invading Ukraine on 24 February 2022, in violation of Article 2 of the UN Charter and preemptory rules of public international law (*ius cogens*). His forces have breached international humanitarian and human rights law and committed war crimes (International Criminal Court 2022). Millions of Ukrainians have fled the country amid thousands of civilian deaths and the destruction of economic infrastructure and tens of thousands of homes. Mr. Putin threatened nuclear retaliation in response to NATO's defense of Ukraine, while warning that the Ukrainian state risked being dismantled by force if it resisted Russia's purposes.

But the situation in Ukraine also represents a failure by the states and international organizations that opposed Mr. Putin's act to deter the invasion (Collins and Sobshack 2023) and to meet their *responsibility to protect* (UN Responsibility to Protect) Ukrainian civilians and civilian infrastructure, after deterrence failed and the invasion took place.

Despite the failure of Russian intelligence, logistics, and command and control; the courage of Ukraine's armed forces; and the intelligence shared by NATO allies, the war reached a brutal stalemate at the onset of winter due largely to the introduction of ever more [and more sophisticated] Western hardware into the theater, increasing the intensity of the fighting. These failures, and the miscalculations in both Moscow and Washington that gave rise to them, have had global costs—triggering food, fuel, and debt crises, reinforcing inflation and the risk of recession in many countries; diverting civilian expenditure to military purposes; and, by introducing vastly more weapons into this contested region, setting the stage for a protracted conflict, and for the diversion of arms to criminal syndicates and terrorist organizations in its wake. *Both Moscow and NATO are victims of the illusion of control.*

## FURTHER DISRUPTION OF THE GLOBAL ORDER

Earlier, populists and nationalists, also in the United States during the Trump presidency, erected barriers to free trade, investment, immigration, and the spread of ideas. Beijing's challenge to the international economic system and to US-led security arrangements in Asia encouraged Washington

to obstruct China's further economic integration. The Russian invasion and the Western sanctions that followed have corroded global trade and investment flows. As the *Economist* noted on 12 January 2023, the United States is leading a trend toward subsidies, export controls, and protectionism. US subsidies of \$465 billion for local production of green energy, electric cars, and semiconductors and efforts to prevent undue foreign influence over the economy are complemented by interdiction of the flow of exports of high-end chips and chip-making equipment to China (The Economist 2023).

China's cautious response to the Russian invasion, acknowledging the circumstances that had triggered Mr. Putin's actions while calling for respect for Ukraine's territorial integrity and the need for a diplomatic resolution, did not satisfy Western demands. While Beijing has respected the sanctions imposed by Washington, London, and Brussels, its failure to align with Western approaches reinforced both sentiment and policies against China in the West, reducing its role in Western supply chains.

"Friendshoring" was introduced by US Treasury Secretary Yellen, reinforced by European Central Bank President Lagarde, as a better alternative to integrated global supply chains that were disrupted during the COVID-19 pandemic. In April 2022, Secretary Yellen and President Lagarde noted that rising geostrategic tensions and a volatile security landscape required new approaches to global trade. Both suggested that the ideal of a single, deeply integrated global trade system—embodied in the General Agreement on Tariffs and Trade (GATT) and, later, the World Trade Organization (WTO)—was no longer realistic (Olsen 2022).

Other countries, notably in the Indo-Pacific region, were encouraged to take sides, with Japan and the Republic of Korea reacting to concerns about rising Chinese influence and Beijing's tolerance of the DPRK, tightening their security ties to Washington.

Russia's dependence on its hydrocarbon exports, and the G7's and European Union's decision to cut back sharply on these to reduce Moscow's revenues to prosecute the war, caused reorientation of oil and gas markets in 2022, with India and China becoming the largest importers of Russian oil, buying at a discount, and reselling it in some cases (BBC 2022).

Both the World Bank (World Bank 2023) and the International Monetary Fund (IMF 2023) forecast sharply muted growth in 2023 as a result.

## FURTHER CONDUCT OF THE WAR

On 14 November 2022, Shashank Joshi of the *Economist* offered three scenarios for 2023: **Russia snatches victory from the jaws of defeat**; **Stalemate** (a more probable scenario); and **Ukraine keeps the initiative, inflicting heavy damage on Russian forces, and bringing its Himars within range of Crimea** (Joshi 2022).

In early 2023, the United States and NATO engaged to assist Kiev to launch a new offensive. Washington and NATO allies announced new military assistance, notably air

defense support and armored vehicles, including tanks. Mr. Zelenskiy began to campaign for NATO fighter aircraft.

Concerns over a limited nuclear exchange rose, and negotiations on arms agreements between the United States and Russia have been threatened. The deputy chairman of the Russian Security Council, Dmitry Medvedev, warned that if Russia were defeated in a conventional war, escalation would follow. "The defeat of a nuclear power in a conventional war may trigger a nuclear war," Mr. Medvedev wrote. "Nuclear powers have never lost major conflicts on which their fate depends" (Watling, McNulty, and Meleady 2023).

Even if Mr. Medvedev's statement was only bluster, it signaled difficulties in arms negotiations. On 28 November 2022, Moscow postponed a meeting of the Bilateral Consultative Commission under the 2010 New Strategic Arms Reduction Treaty (New START), blocking dialogue on strategic stability and making an arms control agreement more difficult as Russia's military failure in Ukraine will lead the Kremlin to prioritize nonstrategic nuclear weapons to hedge against failure of conventional conflicts vis-à-vis NATO and China.

Moscow has long insisted that all nuclear weapons be based on the national territories of the United States and Russia and that deployment abroad should be eliminated before an agreement on nonstrategic nuclear weapons. Acceding to this would end arrangements under which some one hundred US nuclear gravity bombs are deployed in other NATO member states for use by US and NATO air forces. After Russia's invasion, allies prioritize those weapons, making it near-impossible to accept Russia's proposal. Mr. Putin has countered by deploying Russian nuclear weapons to Belarus.

Long-range, precision-guided conventional weapons pose another challenge. Mr. Putin said in June 2013 that US conventional strike capabilities "could come close to strategic nuclear weapons." Russia's precision-guided conventional weapons have been unimpressive, with air-launched cruise missiles failing much of the time. Russian forces have used up many precision-guided conventional weapons in Ukraine, leaving the United States with a large surplus. This could lead Russian negotiators to seek to limit long-range, precision-guided conventional weapons in a follow-on treaty to New START (Pifer 2023).

In his presidential address to the Federal Assembly on 21 February 2023, Mr. Putin suspended Russia's participation in the New START Treaty (Putin 2023).

## STALEMATE AND A SECOND MAJOR CONFLICT IN THE MIDDLE EAST

On 1 November 2023, Ukraine's commander-in-chief, General Valery Zaluzhny, commented to the *Economist* on the state of the war, five months into Ukraine's counteroffensive in which it had advanced just seventeen kilometers. He observed, "Just like in the first world war we have reached the level of technology that puts us into a stalemate." He concluded that it would take a massive technological leap

to break the deadlock. “There will most likely be no deep and beautiful breakthrough” (Zaluzhny 2023).

Meanwhile, even as support among Ukraine’s allies for further weapons deliveries was weakening, a second crisis erupted on 7 October, a day after the fiftieth anniversary of the attack on Israel by Egypt and Syria in 1973. Hamas breached the fence separating Gaza from Israel, killing over 1,200 people—mostly civilians—and taking over 200 hostages. Israel’s Prime Minister Netanyahu said his country was “at war” and would “exact a heavy price from its enemies” (BBC News 2023).

The United States and its allies immediately supported Israel, with Mr. Biden describing the Hamas attack as “an act of sheer evil” and stressing US support for Israel’s right to defend itself. At least 14 Americans died in the attack, and it appeared that 20 US citizens were missing (Reuters 2023a). The United States deployed two carrier groups and a nuclear submarine to the region, increased its intelligence support to Israel, and committed to a \$14.3 billion surge in weapons and ammunition from US stockpiles (New York Times 2023).

Amid surging US national debt, a commitment by House Republicans to cut spending, and parallel demands for support to both Ukraine and Israel—the latter a more potent political force in US politics—the Republican-led House of Representatives prioritized aid to Israel and excluded Ukraine in its first funding bill (Reuters 2023b).

#### ADDITIONAL TENSIONS WITH CHINA

Similar miscalculations based on an illusion of control in Washington and Beijing have created a risk of those powers “sleepwalking into war” (Clark 2012). Even short of that, UN Secretary-General António Guterres has warned that the decoupling of the United States and China would constitute a “Great Fracture—a tectonic rift that would create two different sets of trade rules, two dominant currencies, two internets and two conflicting strategies on artificial intelligence” (Guterres 2023).

The US administration’s proposition that global strategic competition is now defined by a contest between “technocracies” and “techno-autocracies” has exacerbated this risk. Tensions over Taiwan despite the “One China” policy and related agreements on Taiwan, and the administration’s decision to deny the PRC access to sophisticated technological capabilities and to mobilize US allies to counter China’s rise in the Indo-Pacific, have sharpened tensions (The Economist 2023).

The US national security strategy and national defense strategy characterize China as “the only country with the intent to reshape the international order, and increasingly, the economic, diplomatic, military and technological power to do so” (National Security Strategy 2022) and as “our most consequential strategic competitor for the coming decades” (National Defense Strategy n.d.).

The Department of Defense stated: “The 2022 *National Defense Strategy*... places a primary focus on the need to sustain and strengthen U.S. deterrence against China. It also advances a focus on collaboration with a growing net-

work of U.S. allies and partners on shared objectives” (Lopez 2021).

The tensions with China, heightened by Russia’s war in Ukraine, and sharpened by the conflict between Hamas and Israel, in both of which Washington and Beijing have divergent positions, have created a schism between the West and the “Global South,” in which Africa and the Arab world have become the fulcrum of a tectonic dislocation. The expansion of the BRICS nations (Brazil, Russia, India, China, and South Africa) to include Argentina, Egypt, Ethiopia, the KSA, UAE, and Iran, and the inclusion of the African Union in the G20 will sustain this fractal momentum during Brazil’s chairmanship of the G20 in 2024, and that of South Africa in 2025. This will enhance the role of the Global South without increasing the efficacy of the BRICS or the G20. The world order is shifting from the Asia-Pacific, through the Middle East, Eastern Europe, and the Caucasus, across the Sahel and West Africa, to Latin America, in the most significant inflection since the fall of the wall in Berlin in 1989 and the explosion of the USSR in 1991.

#### RESTRUCTURING THE INTERNATIONAL ORDER

Political leaders and scholars have recognized for some time that a new international order is needed. In 2015, background papers for a conference at Chatham House declared:

The international order established by the victorious allies after the Second World War has been remarkably enduring. The framework of liberal political and economic rules, embodied in a network of international organizations and regulations, and shaped and enforced by the most powerful nations, both fixed the problems that had caused the war and proved resilient enough to guide the world into an entirely new era. But given its antique origins, it is not surprising that this order [is] ... increasingly under pressure. Challenges are coming from rising or revanchist states; from unhappy and distrustful electorates; from rapid and widespread technological change; and indeed, from the economic and fiscal turmoil generated by the liberal international economic order itself. (RIIA 2015)

The Royal Institute noted challenges of *legitimacy*, *equity*, and *self-confidence*. These do not vitiate the need for a rules-based system, but indicate that the rules have to be revised. While the global order of the second half of the twentieth century was built on a normative and legal structure based on Western values, moreover, no power can now found a world order on its values and norms. The Royal Institute counseled that the reform effort should first clarify the *aims* of the order, and then consider what *structure* was needed to achieve them.

One reference point for the teleology of a rules-based international order might be Hedley Bull’s assertion that a global society must comprise “a group of states, conscious of [...] common interests and common values [...] conceiv[ing] themselves to be bound by a common set of rules in their relations to one another” (Bull 1995).

This does not require states to align all national interests or societal values, but to recognize a certain quantum of

common interests and values that justify the subordination of national discretion for superior collective purposes. It does not require nations to abandon their cultures, or states to abnegate their national interests, but it requires them to recognize that the exclusive pursuit of national interests, mindless of those of others, undermines human welfare.

Normative systems must accommodate *diversity* in social contexts. Adherence to social norms promotes coherent behavior within a group, allowing members to predict the responses of others with reasonable accuracy. *Coherent narratives* frame and embed these norms, while social, economic, political, and legal institutions provide the context for their enforcement. Deference to universally accepted norms and compliance with international law thus enable the acceptance of each state actor by others, while disregard of norms results in criticism and, in more serious cases, punitive sanctions.

Achieving enough international and transcultural harmony to restore order requires agreement on what is essential and advantageous for all, while respecting the particularities of experience, perspective, and belief that reflect our complex ecology. We need to recognize both the communal nature of humanity and its different social forms in diverse geographical and cultural-historical contexts. The question, for purposes of policy, is how to address this polymorphic reality.

Complex modern societies, characterized by specialization, the division of labor, and social coordination, emerged through adaptation and social evolution in different environments, based on the capacity and disposition of people to cooperate under the influence of political narratives, buttressed by institutions. The social norms underpinning each polity may be similar at abstract levels but are not identical. Actions by states, based on their governments' perceptions of the national interest and the military, economic, political, and cultural capacity that constitute each state's power, influence state behavior and determine outcomes in interstate relations.

The role of norms and cultures in defining national identity and purpose, and in constraining naked pursuit of national interest, is thus not constant, as Turkey, Russia, Brazil, and the United States have shown in recent years. Likewise, the extent to which specific norms have permeated national societies is always uncertain. The adaptive response of the US Republican Party to the idiosyncratic stimuli of former president Trump makes this clear.

States are, moreover, not the only actors on the global landscape. Corporations, faith groups, other nongovernmental organizations, and, increasingly, activist citizen groups are significant agents of social, economic, and political change.

## PRIORITIES IN CRAFTING A NEW RULES-BASED INTERNATIONAL ORDER

A rules-based order must address three challenges—*sharing our planet* (confronting climate change and threats to oceans and biodiversity), *sustaining humanity* (addressing

poverty and inequality, preventing and resolving conflict, containing weapons of mass destruction), and *enabling agreement on binding rules* (for trade, finance, intellectual property, taxation, terrorism, and organized crime) (Held 2006).

Events over two decades—from the global financial crisis to military conflicts, civilian displacement, and forced migration, to extreme weather events due to transgression of planetary boundaries—have shown the inadequacy of our present instruments.

The workings of the Earth system in which humanity—now over eight billion strong—is embedded and the global economic and social systems we have created are complex. Human society is a complex system, incapable of collective control, as both absolute monarchs and practitioners of scientific socialism have learned. *Homo sapiens* is part of the bio-geosphere, a more complex, (partially) adaptive system incorporating climate, the oceans, and the biodiversity of our terrestrial and marine environments.

To enable human well-being, we must temper the impacts of human activity on the bio-geosphere. While changes in the Earth system—from floods and droughts to earthquakes and volcanoes—have afflicted humans for millennia, aggregate human behavior is now destabilizing the Earth system, pushing us past tipping points. Limiting this risk is imperative.

A *rules-based international order* fit for purpose at present must thus enable three outcomes:

- delivering economic growth that is socially equitable and environmentally sustainable;
- sharply reducing poverty and inequality, and enhancing opportunity;
- addressing the sources of human vulnerability to promote security at individual, national, regional, and global scales.

Such an *order* must therefore:

- clarify and embody agreement on the norms that will enable our coexistence, while respecting our cultural differences; and
- significantly improve the quality of governance at different scales by ensuring that our institutions are both effective and accepted as legitimate by all (Cleary 2017).

## COMPLEX SYSTEMS, SYMMETRY BREAKS, ATTRACTOR BASINS, AND NEW (META-) STABLE STATES

We cannot control the outcomes of these endeavors. Humanity cannot predict (or control) the outcomes of large-scale human economic, social, or political behaviors, and we can only comprehend the implications of interactions between our growing, technologically empowered human society and the bio-geosphere in which it is embedded if we understand that we are addressing *complex (partially) adaptive systems*.

*Complex systems* have defining characteristics:



- Many strongly interdependent variables, interacting nonlinearly, with multiple inputs contributing to outputs, complicating attribution of causes and effects;
- chaotic behavior, defined by extreme sensitivity to initial conditions, fractal geometry, and self-organizing criticality;
- multiple (meta)stable states, where a small change in the prevailing conditions may precipitate a major change in the system; and
- a non-Gaussian distribution of outputs (Lansing 2003).

These have long been familiar in natural science. James Clerk Maxwell observed in 1890 that “The statistical method involves an abandonment of strict dynamical principles” (Maxwell 1890). Karl Popper argued that the shift from an atomistic, mechanistic ontology to one based on probabilities was significant: “The world is no longer a causal machine. It now can be seen as a world of propensities, as an unfolding process of realizing possibilities and of unfolding new possibilities” (Popper 1990).

We rarely employ these insights in managing institutions or policy. Our failure to understand that systemic disruption inevitably follows sharp increases in the scale of what we connect and leave to work without guidance (like global financial markets) or seek to manage through law and regulation (like international criminal activity or global migration) will be corrected only if we acknowledge the flaws in our conceptual models. Increasing the number of elements connected within a system exponentially increases uncertainty.

The algebra does not determine the outcome. Systemic linkages can either amplify the impact of harmful events—as the financial crisis of 2008–13 showed, and rising evidence of extreme weather events suggests—or modulate and disperse their effects in other conditions. An efficient mechanism to share risk can become a dangerous channel of systemic instability in other circumstances. Risk at the system level may be substantially higher than the sum of individual risks. It matters greatly what we do in creating or modifying linkages, regulating and incentivizing behavior, and adopting or abandoning policies and programs. Haste, greed, and ignorance can result in disaster, but maleficence is not needed to cause chaos. Conscious thought, relevant research, careful reflection, and humility—mindful of the illusion of control—are needed to avoid it.

A critical number of established structures, procedures, and social systems are no longer fit for purpose, among them some of the institutions of global, regional, and national governance, including security arrangements; the “free market system” as it has evolved over the last forty years; the present relationship between education, training, and work; and those that prescribe modes of social coexistence in conditions now shaped by rapid urbanization and globalization, stressed by deteriorating infrastructure, population aging, and generational dispersal. Meanwhile, Dani Rodrik has made a powerful case against *hyperglobalization* on the grounds that it vitiates national democratic accountability (Rodrik 2019).

A metaphor from theoretical physics—*symmetry breaking*—may help us explore the implications of this reality. A *symmetry break* is the point at which the working of a complex system transitions from a symmetric but ill-defined state into one or more clearly defined states (Arodz, Dziarmaga, and Zurek 2003). The transitions usually bring the system from a symmetric but disorderly state into one or more definite states (Anderson 1972).

In *spontaneous symmetry breaking*, the underlying laws are unchanged, but the system changes spontaneously from a symmetrical to an asymmetrical state. Seen in the context of human society, the profound, multivariate asymmetry between the scale and depth of the global *economy*, the absence of a commensurate, inclusive society (or *community*), and the defective state of a global *polity* might have made a *spontaneous symmetry break* inevitable.

On a related plane—partially orthogonal to the first—the impact of a more numerous, economically and technologically empowered human species is influencing the workings of the bio-geosphere in ways that might prompt a *spontaneous symmetry break* across the Earth system: the concept of planetary boundaries—and the risk of severe, indeterminate consequences when they are infringed—has been explored at length. We see rising evidence of this in many spheres today (Steffen et al. 2015).

Our capacity for constructive collective action in this highly connected, but fracturing, world is being reduced. Systemic failure on several levels simultaneously is straining our capacity to manage economies, stabilize societies, manage conflicts, and respect ecologies. Symmetry breaks on each level after inflection points are shifting familiar patterns of interactions to asymmetrical states and effecting transformative shifts of interactions into new configurations in other *meta-stable attractor basins* ([Basins of Attraction](#)).

To extend the metaphor to interstate and intercommunity relations, *symmetry breaks* are putting cooperative existence at risk by encouraging competitive efforts at domination, due to the destruction of the normative conditions and the associated predictability that earlier enabled constructive equilibrium. The fracture between the norms and policy preferences of the “West” and those of the “Global South” is now widely apparent (Razdan 2023).

## CONCLUSIONS

*Symmetry breaking* is occurring at both international and national levels. Relatively few states have escaped social stress in the past decade. Weakened domestic institutions deprive governments of effective instruments to respond to the needs of their citizens and inhibit their capacity to manage competing claims between states. The scale of the economic, social, and political disruption from the *first bio-digital technological revolution* already underway is exacerbating these strains (Cleary 2021).

The pace of transformation in info-, bio-, nano-, and neuro-technologies in private and public, civilian and military entities is so rapid and extensive that neither ethicists nor regulators can keep pace. The Industrial Revolution

(1760–1860), when we had fewer persons with twelve years of schooling than we now have postdoctoral researchers, triggered social and political upheavals that included the American and French Revolutions and the Napoleonic Wars; and, after the defeat of Napoleon and the Congress of Vienna (1814–15), the transformation of the English political system to forestall revolution by giving the vote to all adult males in towns.

The shock waves continued in Europe with the revolutions of 1848, and in the United States with the Civil War (1861–65). The last was a socioeconomic war over cotton production using slave labor in the southern states, waged amid shifting social mores in the industrializing world that characterized slavery as unnecessary and immoral. The Industrial Revolution shifted the global center of economic gravity from Asia—where it had been for two millennia—to Western Europe. The destruction of Europe (and the demise of the Austro-Hungarian, Russian, German, and Ottoman Empires) in World War I saw it shift further westward to the United States, powered by the “second industrial revolution” driven by electricity and the telegraph, and by industrial mass production.

Meanwhile, in Europe, the disastrous clash engendered by the Bolshevik revolution in Russia in 1917 and rising German nationalism, sharpened by the reparations imposed on the Weimar Republic under the Treaty of Versailles; the hyperinflation of 1923; and the Brüning austerity program in 1930–32 deepened unemployment and deflation, and triggered the rise of National Socialism in Germany, other forms of fascism in southern Europe, and World War II, visiting an extraordinary catastrophe, crowned by the use of atomic weapons by the United States to force the surrender of Japan and the division of Europe into NATO and the Warsaw Pact.

The victory of the Allies led to the bipolar age. Washington’s wisdom in supporting Jean Monnet’s concept of a European Coal and Steel Community (and later Euratom) through the Marshall Plan and MacArthur’s stabilization of Japan under the Imperial family and, with Deming’s help, enabling its economic revival ensured the rise and consolidation of the West.

The space race and the expansion of increasingly sophisticated defense technologies generated exceptional “spin-offs” into the West’s civilian economies. A second wave engendered fortunes in internet-based retail. Along the way, computing enabled the progressive financialization of our economies, culminating in the global financial crisis of 2008–13, which showed the inevitability of regulators lagging behind innovators and the failure—and hence illusion—of control.

These disruptive trends will accelerate and deepen as we scale up the quantum of research and development in conflating technologies from fusion to gene editing, from generative AI to “intelligent bots,” and employ them in biomedicine, deep-sea mining, and space colonization. This technological confluence poses profound epistemological and ontological challenges, forcing us to ask “What does it mean to ‘know’?” as AI-powered neural networks approach

sentience, and “What does it mean to be human?” as we modify human structures through gene editing.

Already, neural network imaging models are being used in radiology and oncology with higher predictive accuracy than eminent specialists. In 2021, AlphaFold released and predicted shapes for 350,000 proteins, including all those in the human genome; in 2022, it added 200 million proteins to an online database ([AlphaFold 2023](#)). In January 2023, ProGen created artificial enzymes from scratch ([ProGen 2023](#)), and Profluent designed and created antimicrobial proteins from amino acids ([Profluent 2023](#)).

It serves no purpose to speculate on whether this surging wave of technological capabilities will advance welfare in the aggregate. Some technological breakthroughs will; others will be deeply destructive, not least in warfare, security surveillance, and increases in inequality. It is clear, however, that the scale of economic, social, and political dislocation that this *first, postindustrial, biodigital revolution* will bring in the decades ahead of us will dwarf anything we have seen in the past and will dispel any illusion of human control.

## COMPETING INTERESTS

The author has no competing interests to declare.

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## AUTHOR BIOGRAPHY

Seán Cleary is Executive Vice-Chair of the FutureWorld Foundation, an Advisory Council member of the World Leadership Alliance-Club de Madrid, EIT Climate-KIC, Carnegie Artificial Intelligence and Equality Initiative, and the Institute of Advanced Studies, Kőszeg; a Faculty Member of the Parmenides Foundation; a Senior Advisor and Senior Fellow (and former Board Member) of the Salzburg Global Seminar; a Fellow of the Global Solutions Initiative, a Diplomacy Moderator of the Geneva Science and Diplomacy Anticipator, and a Director of Companies.

He saw diplomatic service in Iran, the United States, and Namibia, where he facilitated all-party negotiations, the release of political prisoners, and the adoption of a Bill of Rights. He served on the Facilitating and Preparatory Committee of South Africa’s National Peace Accord and chaired

the Working Group on the Code of Conduct for Political Parties and Organizations. He served as a Board member of many nonprofit organizations, and as a Strategic Adviser to the World Economic Forum, and has lectured widely on global corporate strategy, development, and conflict resolution.

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