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Rapid Cascades, Coupled Crises

Abstract Improved peacemaking, and step by step progress toward abolition of Weapons of Mass Destruction helps prevent environmental, pandemic, and financial catastrophes. Across four kinds of crises first prioritize simple principles and simple institutions that prevent coupled catastrophes from cascading one to the other. The next step is to pursue requisite variety in responses by diagnosing dialectically when additional interventions will and will not add value for crisis control. Societies can refine slow-food cooking of crisis response plans. A slow-food approach to growing simple institutions can be iteratively responsive to complexity. This is so when institutions are designed for capability to scale up during crises, to be generative, and to be evidence-based learning institutions that gradually accumulate wisdom to confront complexity.

Keywords Complexity · Environment · Pandemics · Nuclear war · Financial crises

Speed, Coupling, Complexity

Complexity of risk is something modernity accelerates. So is coupling of risk from one kind of crisis to another kind, and speed in the globalization of crises. Crises today cascade faster into one another. This is true of economic and ecological crises, the globalization of disease, and security crises. Crises develop increasingly rapidly because of accelerating innovation in global capitalism. Social media platform innovation accelerated the rapid spread of lies to the point of outpacing older, simpler institutions for the proliferation of truths. This includes lies that motivate new forms of dangerous behavior like advocating a coup to put right an allegedly stolen election, or the lie that war can be waged to sustain a new Caliphate to conquer the Middle East and Africa.

Improved professionalization in the proliferation of falsehoods led to election of climate change deniers during the very period of history when it became too late for fully effective catastrophe prevention. New technologies of cyberwarfare, cybercrime and cyberterrorism, new space warfare by electromagnetic and cyberspace technologies, and new ways of disabling them in space, may cascade to horrific hails of space wars. Coupled cascades put us at risk from cyber-threats that tip security systems toward cascades of nuclear weapons use by accident, miscalculation, or linkages to faulty technologies.

Russia, China, and the United States may not be far from capability for multiple forms of Mutual Assured Destruction (MAD), not only MAD by nuclear weapons, but also Mutual Assured Digital Destruction (MADD) through digital time bombs planted, ready to explode on demand, in electricity grids and other systems that serve nuclear weapons targeting, hospitals, telecommunications, and more. They would explode with malware designed to activate during a crisis. No one knows how advanced great powers are in achieving MADD capability. Only technological pessimists could think that while kinetic MAD is within their grasp, cyber MADD never will be.

The June 27, 2017 cyber-attack on Ukraine by Russia turned Ukrainian screens black everywhere. Money could not be withdrawn from ATMs. Ukrainians could not be paid, send or receive mail, pay at gas stations, or buy a train ticket or groceries. Worse, Ukraine could

not monitor radiation levels at Chernobyl and Zaporigia. This combined with effects on hospitals rendered the cyber-attack a war crime against humanity. NATO-based companies with major operations in Ukraine were also devastated. Merck and Fedex alone were hobbled at a cost of \$1 billion as the Russian malware infected their worldwide communications (Perlroth 2021, 18). A couple of years later, before and after covid and when Ukraine staggered from an unprecedented measles outbreak, Russian trolls surged anti-vaccination dogmas across Facebook accounts of young Ukrainian mothers (Perlroth 2021, 19). War cascaded to escalated epidemic severity.

Russia also attacks NATO states with anti-vaccination messages intended to cause health harm, but more fundamentally to sew division in ways that intersect with other cleavages based on politics, race, neo-Nazi belief systems, class, and religion. Other states target Russia and China in the same ways; others target this kind of sewing of internal divisions against Israel; Israel in turn sews divisions among Palestinians and Iranians. From unimagined sources seeds are sown for future fascism and war. The argument of this book is that restorative diplomacy, genuine healing among old enemies, is the fundamental solution to this problem that has worked again and again throughout history in persuading old enemies against future meddling in one another's domestic politics. It is just that restorative prevention and healing are more imperative than in the past, during an era when cyber operations are almost totally undeterrable and do such great crime and war harm that is extremely difficult to prevent technologically. Cybercrime is already the most common and damaging form of property crime for these reasons (Braithwaite 2022); soon cyberwar could become the most harmful form of warfare when the first case of Mutual Assured Digital Destruction turns all the screens black on both sides of alliances fighting a large war.

Russia would be better off had it restored diplomatic relationships with NATO states so they stopped meddling in Russia's internal affairs, ended financial sanctions against Russia, ceased costly proxy warfare against Russia to defend Ukraine. The United States would be better off had it not provoked Putin to meddle in US politics without which Donald Trump would have been defeated by Hilary Clinton in 2016

(Levin 2020). That meddling has been so effective in dividing Americans against one another that even a coup against an elected government could be attempted. It has been effective in stoking fires of neo-fascism in America, in costing US companies losses as high as a billion dollars from Russian hacks, in causing US taxpayers to suffer an inflation shock and the loss of trillions of dollars preparing Ukraine for war only to see its ally lose big chunks of its territory. A continuation of great power politics as usual is a lose-lose game compared to restorative diplomacy that heals the hurts that motivate all these crimes and weakens both great powers vis a vis China (Chapter 8).

Mutual Assured Destruction capabilities with the satellite communications that allow aircraft to land, and other critical forms of communication may not be far off. Russia and China can already destroy the coupling of financial systems and the internet between Europe and the United States. Subsea cables are responsible for 97% of the data and information flows of transcontinental communication and finance (Acharya 2023). Enemies can cut cables somewhere along a vast ocean floor without being detected. Early in 2022 when Russian President Putin was rattling his nuclear saber, Britain and NATO messaged that cutting submarine cables would be ‘an act of war’ (Bone 2022).

This is an example of chokepoint deterrence because there is little prospect this century that humankind could build the number of satellites that would be required with the bandwidth of what cables can do. Russia cut trans-Atlantic cables on a number of occasions during milder crises of the Cold War. Repairing them can take weeks; then they can be cut again. Or Russia could then follow up by cutting another between the United States and Japan/Korea. The United States could reciprocate. Russia is coupled by cable to a lot less wealth than could be destroyed via the coupling of the United States with Europe or Japan. The coupling most vital to Russia since the war in Ukraine commenced is to China and its allies, not vulnerable cable connections across vast oceans. Google is doing it alone to build its own undersea cable to link its North and South American operations and data centers. This may be an attractive Russian escalation target along some future Russian trajectory to threatening MADD—with few Russian companies traveling that line. MADD by this means requires cutting many cables at once because single cuts

can be re-routed along an alternative line, though with significant cost. Something that may have protected the West from the concerted attacks on undersea cables may be that China is a big player in the telecommunications and subsea cable industry. On the one hand, that is not much of an assurance perhaps for a future war with China, backed by Russia. On the other hand, this is another instance of how economic interdependence retains the potential to motivate peacemaking.

Coupling makes us wealthier and more capable of solving problems. Yet the more coupled, the more vulnerable we are. This book argues that because we can no longer 'contain' our enemies from cutting our coupling, nor they contain us from cutting theirs, there is no choice but to get better at turning enemies into friends. We can beat cyberbombs into cybershares that plough furrows of digital and quantum cooperation. We must beat nuclear bombs into nuclear fusion that we share to solve our mutual climate and energy crises. Fear of MADD can motivate the peace movement to educate us on where to seek shelter inside buildings when a nuclear mushroom cloud appears on the horizon. It is a mistake to think that messages on what to do will appear on our screens and airwaves; they may all turn blank at the moment the mushroom appears.

Hence, a second fundamental of this book is that rapidity of change is compounded by the tightly coupled character of crises. As Warren Buffet said of the international economic crisis in 2008, risks today are more coupled than in the past, so the collapse of a US bank more readily cascades to collapse of European banks. This is a fact of life. It is also a fact that we become wealthier as banks sell to one another. Bank dominoes fell at first because they were infected with securitized US subprime loans that were bad loans; in no time banks were collapsing because other banks were. Banks did not know how infected with bad loans other banks might be. So they stopped trusting them. This bleeding rapidly congealed the lifeblood of interbank lending.

A tipping point toward systemic collapse was passed when interest rates on risky interbank lending became so high that banks were stuck with bundles of mortgages in good loans. They were unable to sell them to prop up their liquidity. They could not pay their debts. The only line of credit they could access was taxpayer bailout. Risk therefore became

both more complex and more systemic. Systemic risks are risks that result in crises of whole systems, as opposed to breakdowns of bits of systems. Systemic risk means that collapse of one bit of a system cascades to many bits infecting other bits with catastrophe. In contemporary risk societies (Beck 1992) characterized by compressed space–time (Harvey 1989) and just-in-time logistics for ensuring that all capital is at work rather than tied into inventory, risk complexity can cascade quickly to systemic global crises.

Hyper-Hubs and Hyper-Disruption

Rapid cascades of tightly coupled crises is a terrible consequence of the complexity of a more interconnected world; yet there are many positives. Our generation has been able to visit diverse societies in a way our forebears could not. We are more able to connect to people of other lands, electronically and face-to-face, to taste their food and wine, and to enjoy collaboration with them. Electronically enabled collaboration allowed us to learn faster by catalyzing collective genius. The internet can connect fragments of knowledge to build better, or fragment and destroy knowledge because internet platforms are more profitable when sensational lies cascade than when they connect the dots of banal truths. Money is made rekindling movements based on internet-facilitated falsehoods as different as Islamic State, neo-fascism, pedophilia promotion, and movements for coups.

Network effects have a complexity that can reduce risks of crises until critical thresholds are crossed that are tipping points to systemic risk. A more globalized trading system can mean that if a key supplier collapses in a domestic market, a new one can be found in a foreign market. On the other hand, if banks across the world fear they are at risk from being seen as infected with a collapsing asset class, most might freeze lending, as we saw with that 2008 tipping point. A small number of commanding-heights hubs with a large number of interconnections makes for more fragility to cascading global crises than a system with many peripheral nodes of moderate connectivity (Goldin and Vogel 2010, 6–7). This was a lesson learnt from World War I; an alliance structure that tied one set

of countries to a Berlin hub that felt threatened and encircled, another to a London hub, locked many allies into a world war that previously would have been more regional. Moscow's fear of encirclement today is not so dissimilar to Berlin's complex of fears in 1914.

With the globalization of disease, we saw how fast death moves if a major Chinese city (Wuhan) becomes a virus node, then in quick succession big European (Milan) and American cities (New York). One helpful thing about previous initial nodes of epidemics is that they spread from rather rural nodes in peripheral parts of the world system (Africa and Iraq with ebola, HIV, and MERS). There were no major international airports, streams of tourists, or businesspeople wanting to invest along Congo's Ebola River, nor across the border regions between Iraq, Iran, and Syria where MERS jumped from camels to nomadic herders.

Unfortunately, the world system before 2008 had evolved toward one where two financial hubs—New York and London—dominated more than in previous moments of financial history. Mercifully the third hub taking off in China was by 2008 substantial enough to re-prime global pumps. After the crisis, the biggest financial firms in these cities absorbed many competitors that struggled to survive the crisis. US investment firms BlackRock and Vanguard picked up many cheap assets after 2008. Nodal power became even more concentrated. The global power of the very largest banks in the world that were in China after the crisis, also grew their domination after they were all substantially untouched by the crisis that humbled North Atlantic finance.

For many centuries up to 1945, there was also a degree of multipolarity of military power. This collapsed into a bipolar world with hubs in Washington and Moscow, a world where Berlin, Tokyo, London, Paris, Istanbul, and Vienna mattered less than they did early in the century. A brief unipolar moment ensued after collapse of the Soviet Union. This has now evolved toward the two major industrial powers (the United States and China) becoming the major powers in space (and cyberspace technology), and the dominant military powers.

During the Cold War, Russia had weak economic, information economy, and banking institutions. These past weaknesses of the Soviet Union are strengths of China today. The hyper-connectivity of the new global hubs of Chinese and Western power makes them more vulnerable

to targeted attack, but difficult to attack without harming the attacker. Vladimir Putin has some similarities to Hitler in being a man obsessed with the humiliation of historically recent setbacks that diminished the power of his empire. This alleges no surety that Putin is like Hitler as an empire-builder; he may be more motivated to show the strength to resist further decline. Probably Putin is a mix of offensive ambitions and defensive fears of encirclement (Beebe 2019). Humiliated leaders are dangerous when they see an existential threat in something as normal as Ukraine resisting domination. It may not be likely, but it should not be beyond our imagination to ponder the possibility of Putin planting false intelligence to spark confrontation between Washington and Beijing over Taiwan, that could weaken both greater powers in comparative terms. We know even North Korea with its weaker capability than the great powers could hack a top Russian missile manufacturer (Pearson and Bing 2023).

Putin has already demonstrated the imagination for a targeted attack on the most hegemonic hub of power on the planet. Russia succeeded in reshaping US politics by intervening in favor of Donald Trump, including in ways as creative as funding an unsuspecting Trump supporter to appear at rallies with a 'Lock Her Up' truck equipped with a Hilary Clinton model inside a cell with prison bars to create content for Lock Her Up video clips on social media. It is likewise having some impact with covert financial and other sustenance for far-right political parties that have attracted increasing support in Hungary, Poland, Austria, Italy, France, Germany, even Sweden, among others (Belton 2020). But for Russian interventions like the hack and leak of the Democratic Party server, Hilary Clinton would have won the 2016 Presidential election (Levin 2020), an election controversy that greatly destabilized America. The hack into the server of President Macron's party and leaks of troves of political damage two days before the 2017 French election helped to divide France. In this case, it did not lose Macron the Presidency. It was combined with a Russian fake news Facebook campaign against Macron's liberalism (Jasper 2020, 122). The largest democracy, India, is corroding from upper-caste supremacist trolling and terror of far-right Hindu fundamentalists. Many major Western democracies are endangered by white supremacist terrorism and far-right electoral politics. One can overstate how important Russian campaign

funding and trolling is in the rise of neofascist politics across democracies. The structural character of hate speech on unregulated platform capitalism is the more profound explanation. If restorative diplomacy and a respectful future relationship with post-war Russia can help avert foreign cyber-meddling, however, this is another good argument for restorative diplomacy (Chapter 8). The hope is for restorative diplomacy with a post-war Russia that has abandoned old imperial ambitions and by a NATO that abandons its new but contested imperial ideas of expanding even to East Asia.

A theme of this book is that cyber-attack risks have grown as a result of hyper-concentrated hubs of hegemony that have become ever more concentrated as a result of one form of hegemony cascading to other hegemonies. These are hegemonies of Weapons of Mass Destruction, weapons of market destruction, weapons of chokepoint domination of platforms and of panoptic surveillance through platform capitalism, weapons of domination of space and cyberspace, and domination of global regulatory institutions in which both Washington and Beijing now strive to dismantle the rules-based international order in ways that favor them. Just as Western states granted impunity to Japanese and German war criminals who were testing biological weapons in their concentration camps, likewise today it is clear that Russia (and likely other major powers) grant impunity to cybercrime corporations. They gather criminals to steal secrets and attack targets that might harness networks of millions of computers (botnets) to cripple whole systems of commerce, freeze foreign financial systems, harden arteries of hospitals, water supply, electricity, e-commerce, e-governance, and democratic governance itself. Homeowners occasionally suffer homes invaded by a burglar. All who own computers on phones, on desks, have had them invaded countless times by bots. This makes it odd when criminologists say that property crime rates have been in long decline in Western societies. Sure, terrorist organizations like the IRA no longer organize armed holdups of banks; why would any rational terrorist fund terror today by high-risk crimes of that kind? The modus operandi of terrorists, common criminals, and espionage alike are increasingly tied to the internet.

One fact about hyper hubs of global domination, particularly in the United States and China, is that they are hubs of innovation into useful

new technologies never seen before. For the same reason, they are hubs of cybercrime and cyberwarfare excellence in innovative technologies for crippling technological systems on earth and in space. They keep their most novel destructive capabilities secret because the future cyber-crises inflicted by national security states will be more damaging to the degree that they surprise as never seen before. No virus worth its disruptive salt does much damage without being novel. It is when there is some novelty about financial crises that regulators fail to understand, prevent, or even spot them coming. No banks had thought in the twentieth century that it was a good idea to lend to the poor at scale for housing. It was radical financialization of capitalism that made demand sustained by bank debts of the poor an attractive idea to finance capitalism. Then at hegemonic nodal finance hubs, innovation in derivatives financially engineered novel securities that made a new kind of collapse of bank dominoes possible in 2008.

Ambitious young people are dazzled by prospects of participating in productively innovative hubs. Many of these great young minds migrate from the promise of innovation in production to innovation in destruction, from 'do no evil' to 'do novel evil'.

Accelerated speed of crises of diverse kinds explains not only the quantitative coupling of micro crises (e.g., at a bank) to macro disasters (of a global financial system). Acceleration also explains why one kind of crisis moves so fast that it cascades into qualitatively different kinds of crises, as hypersonic nuclear missiles might when they travel so fast that there are only minutes for correcting false alarms of impending nuclear attack. An accelerating crisis can cascade so fast to a different character of crisis that it might be too late to shut it down before the character of the new risk cascade is understood. The war in Ukraine helped stoke global inflation, trimmed every country's economic growth projections for 2022–2024, with particularly steep collapse for Ukraine and Russia, even more so for the world's hungriest people dependent on their grain and fertilizer exports, and on affordable food and energy generally. An artificially strong US dollar then led the poorest societies into perilous debt traps from which they could not extricate their starving citizens. When different kinds of crises cascade into one another, crises become more complex, nonlinear, and unpredictable.

Societies with a pathological will to power in future may roll the dice on catastrophic cascades of American crises if they tip the balance in favor of a Donald Trump, or roll the dice on a new form of cyberespionage against capital markets that might cascade an inventive form of financial crisis, or spread a pandemic for which only they are prepared with vaccines and countermeasures. That would be a stupid thing for Russia to do. Then we already know that those with the most extreme will to power in Moscow are capable of playing with foolish forms of fire.

Slow, Simple Solutions for a Fast, Complex World

How can there be simple solutions to the speed of coupled crises that are complex? The beauty of simple solutions is that a slow-food approach to institutional preparedness is generative of nourishing institutional flavors that can sustainably penetrate societies buffeted by fast-moving cascades of tightly coupled crises. Slow food is an antithesis not only to fast food but also to fast fashion that mimics global metropolises of fashion capital with mountains of rapidly obsolescent clothing. Nicole Perlroth (2021) visited Facebook headquarters to see graffiti that crossed out ‘Move fast and break things’, replacing it with ‘Move slowly and fix your shit’. Societies can have it both ways. They can have entrepreneurship that drives creative destruction, and institutions that preserve security for the planet.

A quality university system that is not captured by the very military-industrial complex that is throwing babies over the waterfall is a simple enough institutional imperative. Universities are vital to building strong markets, designing effective regulatory institutions, and energizing civil society. Universities are institutions that we know how to build again and again across every society. They can deliver capability for responding to the most complex of phenomena. This foreshadows one conclusion about simple solutions for containing catastrophe. The simple solutions are often stable institutions that are designed to eschew simple-minded responses to complexity by being nimble and independent in their thought about how to scale up containment of complex emergencies.

This renders them generative of problem-solving. A paradox is that a good university is a slow-food accomplishment that enables rapid detection and rapid response to catastrophic risks.

The independent university is a simple institutional idea that is increasingly compromised in markets for university influence captured by a military-industrial complex and corporate funders with agendas about channeling citadels of knowledge to corporate interests. Universities do better when they ‘just say no’ to nuclear weapons manufacturers, cyberwarriors, space war entrepreneurs, gambling firms, alcohol and tobacco conglomerates, and any organization with an interest in growing sales of dangerous products. If societies get the tried and true institution of independent universities settled, they can do endless productive unsettling of a whole range of other institutions to help them become more adaptive to complexity. That is not without ethical complexity: societies should not want universities working with defense contractors to develop DNA sequencing to spread novel epidemics that create greater havoc because they use ingenious AI. Yet no one wants to stop DNA sequencing designed to conquer disease. Former World Bank leader Ian Goldin (2021) made the point that Silicon Valley managed step changes in the character of capitalism, not just incremental change, not only slow-food approaches to business institutional change. Goldin asks could Silicon Valley have been possible without Stanford and other great universities in its vicinity. Stanford was a slow-food institution long replete with scientists plugging away at big ideas for information transformation in a slow-food way.

While the idea is simple, universities in important ways are captured by national interests that are partly shaped by a military-industrial complex that beckons universities to articulate ideas about the ‘national interest’ to mass media obsessed with an interest that is national, sometimes imperial. International interests in diffusion of peace globally are less likely to deliver ‘impact’ for university professors or for national media organizations. There is complexity in how academics should manage those pressures. For an American academic, is it more important to narrowcast important ideas to engaged activist audiences or to broadcast to apathetic mass audiences? Is it more important to reform the New York Times so it is interested in genocide risks in countries where

suffering fails to capture the national imagination in media markets? Is it important to subscribe to the New York Times because it is more internationally engaged than dailies of lower quality? Or is it better to give to Reporters Without Borders because they support more courageous front-line non-white reporters, who only occasionally place their writing with the New York Times co-authored with a white American journalist? Is it less important to support progressive neo-colonial media that remain obsessed with the national interests of white-majority societies, and more important to support new media from Africa engaged with big questions of war, peace, debt, and environmental collapse that seek negation of neo-colonial realities. It is a neo-colonialism of journalism where Nigerian media source news on fighting in Libya from Reuters or the BBC. I found that one method for academics from white-majority countries to support a deeper form of independence of the Western university is sometimes to set up a base in the Reporters Without Borders office of a front-line society, learning from them, nurturing and valorizing their work through our Western writing.

It is simple thinking to have a substantial ambulance service that is nimble and well designed to scale up speedily. That takes decades of slow-food institutional development of a service cooked through experience with crises like COVID-19. Then when bigger crises like a nuclear war require more rapid scaling up, the ambulance service has become a simple, resilient institution in better repair for the complex crisis. In the meantime, a well-funded, efficient ambulance service responds to lesser but important crises like homicide that between 2015 and 2021 took 3.1 million lives worldwide (United Nations 2023, 5), or an opioid epidemic. Especially in poorer countries, this is one of the cheapest, simplest ways to simultaneously reduce the homicide rate, the incidence of deaths from drug overdose, and tragic health consequences of suicide attempts. A good ambulance service gets people with stab or gunshot wounds, or overwhelmed by drugs, to the hospital quickly. That is, an institution that can contribute so much to reducing death rates from future nuclear wars and global pandemics can pay for itself by stemming the flow from stab wounds, the collapse of bodies burdened by opiates, this year. That is what thinking slow and simple means about the

institutions required for rapid response to complex crises. Sadly, corporatized universities neglect research that would help ambulance services to become more evidence-based as they grow to be responsive institutions. Ambulance services do not have the scale or resources to be big funders of universities. Universities become ambulance chasers of the wrong kind; they are hooked on chasing the corporate ambulances with research funding cash.

Covid illustrated how developmental states like Taiwan and Singapore had the required simple institutions of pandemic response crisis-ready, while states that had misplaced faith in market preparedness to respond to all ills—Trump’s United States, Johnstone’s United Kingdom, Bolsonaro’s Brazil, did not. Some formerly neoliberal states like Jacinda Ardern’s New Zealand adapted well to behave more like a developmental state that valorized simple institutions of adaptive preparedness. The European Union learnt from these mistakes, from the millions of covid deaths that might have been prevented, learnt from East Asia to be crisis-ready next time with a new pandemic preparedness agency. Other societies like Australia, and perhaps Canada, that did not manage covid badly overall, nevertheless performed disastrously in learning lessons from the pandemic about strengthening their aged-care workforces and regulatory systems (Royal Commission into Aged Care 2020). The wealthiest societies that should have been best prepared with simple preventive plans, because they had the resources to fund strategic prevention, performed worse than Africa with all its poverty. As with the politics of climate change, the problem in societies like the United States was that voices of university experts on the complexity of pandemics were trumped by a platform capitalism that proliferated covid lies. There was simply more money to be made when these platforms were put at the disposal of political lobbies in rich societies.

The demands of rapid waves of coupled crises require societal commitments to simple institutions of surrender to the realities of not getting the world we might want. Who wins the next election is not as important as having a stable system for transferring power from the last winner to the next. Who wins the next great power contest is not as important as having a stable system for moving on from the current to the next number 1, both constrained by a rules-based international order. Who

is number 1 is less important than numbers 1–5 accepting that who is number 1 will change from time to time. The important thing is working together for stable progress of all major powers to extinguish crises and commit to that rules-based international order. It is in the interests of the United States to constrain its maritime power by joining the Law of the Sea Convention, because one day it will be number 2, and right now China is reshaping and gaming the Law of the Sea as a member of the Convention preparing for the time when it will rule the seas.

Because war risks are so catastrophic, we all have an interest in stability and balances of power that change at a pace societies have time to adjust to. Suites of institutional stabilizers are needed that are learning institutions, but that are tried and true, simple enough for the poorest societies. WHO did not do a totally bad job of assisting the poorest societies of Africa to speedily grow those simple institutions for stabilizing COVID-19 and ebola; it performed more disastrously in WHO persuasiveness with great powers. Great powers were smart enough to co-opt brilliant Turkish immigrants in Germany and the US National Institute of Health to their vaccine money-making. These states lacked the wisdom to stem the flow cascading from new covid variants by rapidly rolling out vaccines at low cost to the world's poor. The world was lucky when Omicron took over as a less deadly variant. Next time policy stupidity might be ravaged by worse luck. This book argues that former Australian Foreign Minister, Gareth Evans (2009), is right that good luck is also why the world has not stumbled into a nuclear war it wished to avoid. Luck runs out for societies that fail to rise to the challenge of institutional preparedness for catastrophe prevention.

Cascades of crime waves feed into waves of war. They cluster at war-torn regions like the Middle East, the Balkans, the Horn of Africa, and the Great Lakes region of Africa (Braithwaite and D'Costa 2018). These are examples of complex cascades. Having a good ambulance institution designed to scale up quickly is good for containing harm from radically varied complexes of cascade phenomena. While cascades are complex, nonlinear, frequently passing tipping points to reverse direction, a well-designed ambulance service is an example of a simple institution for containing that complexity, however complexity unfolds. A good university system that does the research and training to diagnose

the changing directions of complex crises as they pass tipping points is another example of a simple institutional imperative to maintain good order. That institutional imperative is simple, even as what universities do through their research is complex. There is a degree of complexity in running university administrations to maximize excellence in mastery of complexity. Nevertheless, it is a deadly simple policy for a state to fund a strong system of universities to compete with one another in pursuit of inventive excellence and in recruiting the best students. This insight is of a piece with saying that picking winners in markets is complex and difficult; but a policy that protects the competitiveness of markets through resilient commercial law enforcement has proved less complex to preserve, as more and more societies have reaped benefits from such policy settings.

This book is particularly concerned about four kinds of crises—climate change, crime-war cascades, epidemics, and financial crises. These catastrophes are conceived as complex and prone to cascade effects. It is well documented that climate crisis proceeds as a cascade phenomenon that takes ecosystems beyond tipping points that resist reversal. One reason climate crises have complex effects is the large impacts that climate cascades are likely to have on these other three kinds of crises. As rivers dry up, powerful states are then tempted to divert melting snows away from flows into weaker countries' river systems. When they divert this water, the stronger state might suffer cyber-attacks, terrorism, or arming of a domestic insurgency (Smith et al. 2022). African and Middle Eastern states do this kind of diversion of surrounding states' rivers with damaging effects for regional stability. There are fears that China might divert Himalayan snow melts from flowing South into the huge river systems of India, Pakistan, and Bangladesh and great South-East Asian river systems like the Mekong to instead replenish drying systems critical to Chinese famine-prevention, like the Yellow and Yangtze River systems. Such temptations cascade in complex ways toward future wars.

War in turn cascades to economic crises and to epidemics. A well-documented example is the way that the deadliest cascade of war of the past half century centered on the Democratic Republic of Congo. That fighting massively spread HIV-AIDs across Africa. More than twenty

foreign armies were fighting inside Congo. Mass rape occurred at a monumental scale. Foreign soldiers raped to spread the virus back home and across the continent. There were times when instability in Congo did not help with containing ebola, which first appeared on Congo's Ebola River and had ten further Congo epidemic waves. To this day ebola is still a virus that adapts and is not fully contained within Africa. Afghanistan and its bordering Northwest region of Pakistan is the region of the planet where polio regained a foothold thanks to endless cascades of warfare. The alleged role of polio health workers in the discovery and assassination of Osama Bin Laden did not help with the ongoing popularity of killing polio vaccine teams as Western collaborators wanting to do harm rather than good. Jihadists passed polio workers' cars on a motorbike to fire into the vehicle. The result is a planet that still lives with one of history's most horrific diseases.

Climate crisis directly engenders epidemics because as forests are destroyed, wildlife that clings to green strips near towns is thrust in close contact with humans. Australia sees this with mass bat infestations of city parks. Viruses leap from bats to humans in ways that did not happen in the past when bats stayed in natural habitats without venturing into city centers. Viruses leapt from apes to humans in new ways in Congo with HIV-AIDS and along the Ebola as destruction of Congo's tropical forest habitats moved apes to trees on the fringes of human settlements.

When climate crises cascade to wars and the globalization of disease, these cascades can in turn cascade to economic crises. Covid illustrated this dynamic of thrusting the world into recession, and then later into an inflation crisis. This book diagnoses the various ways each of these four crises have tendencies to cascade into one another. In sum, we see two general features of importance in these trends. One is that in conditions of connected-up modernity, crises cascade faster. The second is that crises have become more tightly coupled. An implication for this book is that some of the most generic simple solutions to catastrophes are simultaneously relevant to all four types of catastrophes, as this chapter has illustrated with a slow-food approach to resilient, scalable ambulance services and universities.

I take a page from the playbook of institutional anomie theory and apply it to interconnected crises of modernity (Braithwaite [2022](#)).

This arises from an interpretation of the way Messner and Rosenfeld (2012) forged institutional anomie theory from the insights of Robert K. Merton's (1968) *Social Theory and Social Structure*. Anomie is the collapse of the normative order of a society. It unfolds as a kind of cascading collapse of moral order. Anomie effects are complex and prone to reversal. Emile Durkheim explained the rising nineteenth-century suicide with the social disruption of industrialization. William Julius Wilson (2012) and Braithwaite (2022) explain the steep crime rise of 1960–1992 in Europe, North America, and other developed economies through anomie associated with *deindustrialization*. The institutional anomie point is that however complex are cascades of anomie, it is important to have strong basic institutions like a good education system, a resilient health system, loving families for raising children, plentiful employment, and rights of access to housing for the poor. Such institutions are well understood. Many societies have done well in building them at different stages of modern history. Other societies at other times have not. While the rapidly moving and coupled crises to which they respond are complex to understand, these simple institutions take long histories to consolidate. Institutions of quality housing for the poor, for example, are not complex to build. They take decades to consolidate, construct, and maintain; just as they can be rapidly destroyed by neoliberal reformers of housing markets. Care is required to prevent the corrosion of housing markets at the hands of neoliberal ideologues. Welfare states and communist societies of the 1950s and 1960s were not as wealthy or sophisticated as today's market societies, yet they did a much better job at the simple task of building up adequate housing stocks for the poor to conquer the homelessness that makes it so much harder to conquer other cascading problems such as new forms of substance abuse (like fentanyl), suicide, and crime. We know a great deal about what we need to do to build and preserve the simple institutions that contain complex catastrophes.

Some of the cascades that have surged homelessness have been more complex institutions that great financial minds like Warren Buffett and Allan Greenspan confessed to misunderstanding. The worm in this apple was complex Wall Street markets in slicing and dicing securitized

subprime mortgage loans.¹ This book argues that simple regulatory institutions were capable of controlling this catastrophic cascade across banks and societies. The problem was clustered at some Wall Street and City of London institutions that were trusted by regulators to be too clever for their own good. Countless more simple-minded regulators than those responsible for the New York and London markets did a better job of protecting global markets when they said, in effect:

I'm sorry, but I'm not smart enough to understand the risks of this financial engineering with housing loans. All I can understand is that loan defaults are rising. Although I might not be as clever as you, or as clever as regulators of Wall Street, at grappling with complex derivatives, unless you can explain their risks to me in simple terms that I can master, I am going to stop your bank from trading in them.

Many humble mature-minded CEOs of banks said something like this to their brash and brilliant young derivatives traders. They saved their banks from disaster. Eastern hemisphere leaders of prudential regulatory agencies who learnt humility after the 1997 Asian Financial Crisis saved their economies from recession in this way in 2008. So did the chair of the Polish prudential regulator. This book will discuss why Poland was the European economy that performed best during the crisis years and the years immediately after. These leaders served their economies and societies with slow food thinking about defending institutional integrity.

What Kind of Simplicity Helps Manage Complexity?

H.L. Mencken famously said: 'For every complex problem, there is an answer that is clear, simple and wrong'.² Actually there are always many, as there are always many wrong answers that are complex. This book argues that there are also some complex answers that are right, but that are unknowably hard for science to credibly validate as right because of methodological complexity associated with omitted variable bias.

Complexity hides the effects of variables that are unobserved, unmeasured, but that may be the real drivers of crises that have escaped the explanatory imagination of science. In addition, there are some simple answers that are methodologically more feasible to validate as right, even though they fail to account for the full complexity of problems that never fully yield even to joint explanation by a suite of parsimonious explanations.

IT innovation aims to make life simpler. When lost, our smart phone tells us where we are. It can tell us how much exercise we do, forgotten historical facts, and more. The worm in the IT apple is that in aiming at making our lives simpler in endless new ways, thickets of Apps on phones became more complex to navigate. They opened up even more backdoors to hackers. We end up spending less time on simpler things in life like coffee with a friend, more time tapping devices, when it is not screens we are born to respond to, but faces and relationships. Proliferation of many good, simplifying IT innovations burdened us with a more complex totality to our lives. Endless micro simplifications sum to macro complexity. When simplicity morphs into complexity, it takes longer to get stuff done. It is harder to do so, especially for older people overwhelmed by accelerating pace of change that requires downloading new Apps to get simple things done. We find that IT makes life less human, more confusing, and stressful to navigate, leading many to give up on this new mainstream of complex modernity. A world of more gadgets has proved less friendly, especially after cyberspace opened up new frontiers for criminals to con us, cyberwarriors to threaten our privacy, security, our anxieties, and new entry points to our children's lives for exploitative adults.

Tax law illustrates this. I have been writing on simplified tax and business regulatory solutions to complexity for decades. States write simple new tax laws to guide business and individual taxpayers in how to pay the right tax as new forms of business, then new kinds of business entities (like trusts) are created that individuals can reinvent themselves to be, or be part of. As the sheer number of simple rules grows, clever tax lawyers use one simple rule against another. They argue in court that the doctrine behind one simple rule applies to this case in a way that means another simple rule should not apply. This is why, even though many bright-line

tax rules are needed, new rules should be justified in terms of the law of a smaller number of tax principles that are debated and understood in a democracy. This means that in a contest within a complex thicket of tax rules, the small number of simple overarching principles should be able to trump the complex of rules. Simplification of the institution of tax law to make it more responsive to a limited number of overarching principles is an answer to complexity driven by the accumulation of simple rules. The accumulated mess of rules is comprehensible only to well-heeled tax lawyers and those who can afford their advice. Tax law became a tangle that privileges the rich to get away with paying no tax, while the rest of us shoulder the tax burden. In tax law, as in modern life in general, it is easier for professionals to add to what is already there than it is to take away. A sound law of simple tax principles would take down many rules that add more harm than good to tax system integrity (Braithwaite 2005). As with IT vendors, so with tax professionals, the market incentives are to sell new add-ons, band-aids, and workarounds to each extra trap opened by aggregated rules. This is when what is needed is transformative re-institutionalization of strategic simplicity.

A solution to the danger of simplicity degrading to renewed complexity is certainly simple, stable institutions. An example is principle-based tax law that oversees the complex dynamism of endless new rules, a tax law guided by a manageable number of principles that can deal with novel developments in an economy.³

The human brain can deal at one time with fewer variables than the fingers our hands can count. The way humans adapted to a world more complicated than the worlds our brains had evolved to manage are *institutions* that we can rely on to grapple with complex understanding of thousands of variables at a time. The way good institutions for tax system integrity grapple with thousands of tax laws at once, millions of tax laws of other countries, is just an example. If we want a just and economically efficient economy, we do well to support the simple virtue of a responsive tax authority and tax law. In such a system, the government argues to appellate courts empowered to rule that a simple law is being used to compromise the tax system's integrity of commitment to its overarching principles. Judges respond by striking down the application of this simple law to the complex circumstance of cash flows through multiple tax

havens, for example. The fundamental principles of tax system integrity trump the rule; the simple integrity of the tax system is restored. The regulatory literature shows that other kinds of regulatory inspectors paradoxically have the cognitive capability to more consistently enforce the law and to more effectively improve compliance when an inspection team assesses 30 broad and vague, but generative principles, than when they enforce a thousand precise, specific rules (Braithwaite et al. 2007). It is a paradoxical feature of regulatory science that broad, vague principles can prove more valid than many precise rules for delivering valued outcomes, and more reliability (consistency at the hands of different inspectors, or across different contexts).

Limits of human cognitive capability force us to respond only to some aspects of our complex and dangerous world. If we choose to focus on the wrong variables, ignoring more germinal ones, we make terrible mistakes of unresponsiveness to the complexity of the world. This chapter has argued for committing politically to three institutions that are generative of complexity management: an ambulance service that can scale up, a university system with independence and regulatory institutions (such as a tax authority) with principled responsiveness. The rest of the book will discuss more institutions with these generative capabilities for managing complexity. There is an evidence base that each of these institutions and policies has proven effective for crisis prevention or amelioration. They are, nevertheless, only tentative suggestions to start a better conversation. The important systematic work on which are the most important simple solutions remains to be done.

National and sub-national pandemic preparedness plans are also simple basic solutions. For the maintenance of financial stability, not only is a credible tax enforcement system imperative, but so is a credible regulatory system that defends the integrity of markets by enforcing laws against fraud, corruption, and monopolization. Money power misguides all societies to under-invest in these. A simple imperative that is important for pandemic prevention and prevention of international financial crises is international cooperation on crisis prevention. This has been even more critically absent in setting simple targets to prevent climate change, regulation to enforce those targets, and scientific cooperation on R & D to invent new technologies for renewable energy and green

growth. Tragically, as the crisis gets worse, obstacles to prevent Western scientists from collaborating with Chinese scientists, or outstanding scientists in 'rogue' states like Iran, deepen.

Another simple solution to environmental crises is planting more trees appropriate to local ecosystems and felling fewer. The book argues that while China has been managing substantial, environmentally consequential, reforestation, other countries with large land masses have not, notably Australia, Russia, Canada, and the United States. We must rush to insist that such simple solutions as planting enough trees have become entangled in complexities of offsets markets. This is because regulatory institutions fail to prevent fraud in carbon markets and fail to quash greenwashing. Yet this is just a simple point about the interconnectedness between simple solutions to securing the integrity of markets and simple reforestation policies. It always was predictable and predicted that as the price of carbon went up, carbon fraud would increase and fester as an organized global complexity corrupting carbon markets.

While responsive business regulation is a remedy to environmental and financial crises, this book's most important simple solution to catastrophes of war is strengthening nuclear weapons treaties, and regimes against other Weapons of Mass Destruction. Arms reduction agreements can be satisfactorily simple so long as mutual inspection is robust, so long as all nuclear plants are subject to compliance inspections without notice by international inspection teams. Trust and verify works, as Ronald Reagan and Mikhail Gorbachev agreed. Simple reforms to international extradition laws can have a bigger peace dividend than meets the eye. So can a simple transformation of the profession of diplomacy to restorative diplomacy, and for simple rules of states constraining themselves against regime change, meddling in the elections of other countries, assassinations, and proxy wars to fragment the sovereignty of other states. The book argues that the evidence is strong that the world irrationally underinvests in UN peacekeeping. On many of these fronts, I argue that there are simple requirements for institutions of freedom from domination that mean by reducing crime (including crime in financial markets, crime in carbon markets, fraud and corruption in health systems) societies better equip themselves to cope with all four types of catastrophes.

If our focus becomes more oriented to getting simple institutions guided by some simple principles right, we run less risk from the inevitability of focusing our limited cognitive and political capabilities on a small number of variables where we believe the attention should be, only to find that the variables of our focus cause us to oversimplify. We often back the wrong horses, averting attention from picking winners that run stronger because they are generative of complex problem-solving on a wider front. When humans tire of fast food, a poor solution is to pile up more mountains of fast-food alternatives that make quick profits until people tire of their tepid food values. The transience of their taste surges could have been better satisfied by simple, slow food that has enduring, generative virtues. Likewise, when a child says, 'I'm bored', one remedy is to thrust a device at them on which they might flip to another screen, another film clip. We educate children less than we should in the slow-food art of tarrying contemplatively on the pages of a good book. In the end, another fast audiovisual fails to extinguish boredom in the way reflective engagement with great literature can conquer boredom deeply, slowly, nurturing young souls. Scanning another screen is insufficiently generative of those deep habits of contemplation that do conquer boredom, not merely momentarily, but for a lifetime. Hence, simple principles of good living like breathing the beauty of trees, and the institutions that nurture those principles, are prioritized because they are so generative of human flourishing. In this case, the flourishing of trees nurtures birds that nest in them, which in turn nurture us.

Requisite Variety

A principle of cybernetics (the science of learning to steer networked phenomena) is requisite variety. It means that when we fail to consider enough variables, if we can make a difference by asking questions about more variables, then we have oversimplified. By oversimplifying, we lose the ability to steer. On the other hand, if we add too many variables, we give ourselves too much to do; then we also lose the ability to steer the flow of events. In conditions of escalating complexity, a way to optimize

the principle of requisite variety is to prioritize institutions that are generative of problem-solving. This means that in the journey toward requisite variety for crisis management, start with simple institutions and principles of broad and generative preventive power. Then cultivate the craft of moving dialectically between the simple and the complex. Starting institutions may make a lot of mistakes, but because the institutions with preventive capability are generative of learning, are learning institutions that cultivate reflection and regulatory conversations, they also have an institutional memory that corrects for mistakes.

By getting this limited number of institutions right, we give ourselves more room for making mistakes in grappling with complexity, be they mistakes of oversimplification or of losing our way because leaders do not understand the complexity of the models supposedly guiding their steering of risk. The financial crisis that unraveled the world economy in 2008 was an example of the latter kind of error. It will become more recurrent in worlds of AI that are beyond the comprehension of executives. International society failed to cushion the 2008 crisis because simple institutions such as ratings agencies failed to do their job of simple truthfulness in ratings of risk. Then financial regulators failed to prosecute or revoke the licenses of ratings agencies to prevent persistence of this fraud. More fundamentally, they failed at conversational regulation (Black 2002). Financial regulators were not conversationally generative of reflection by quick-money ratings agency executives on where they were leading their clients. The entire financial system lost its way.

Accomplishing requisite variety is difficult. After each pandemic, humankind does learn, but we are repeatedly struck by limits to our understanding of the complex ways they unfold. Why did this town lose so many more lives than others? Why did new waves occur at certain times, not others? Most epidemiologists expected that covid would be particularly deadly in Africa, as HIV had been. Most international relations experts thought that Russia would not invade Ukraine in 2022 because this would be irrational. Most finance experts early this century thought that big banks were sufficiently rational that they would not fail to prevent the kinds of bankruptcies that befell them in 2008. We learnt enough to understand that there will be more global financial crises, without learning to grapple with where, when, and why the next one

will occur. We learnt that trust in the self-interest of banks in saving themselves must be hedged by vigilant, resilient, responsive regulatory institutions that insist on simple things like adequate reserves, monitoring that ratings agencies are not captured or corrupted, and insistence that banks explain clearly to regulators how their risk models work. That means providing credible results from testing them.

In this, my contribution is modest. The book concludes that a good way to pursue requisite variety in response to complex crises is to secure well-tested fundamentals of prevention more than we do. Most low-hanging fruit of preventive simplicity are institutions, like an independent university system well-resourced to grapple with wicked problems. Some are simple principles, such as reluctance of governments to meddle in the domestic politics of other countries. Meddling tends to be against the interests of meddling states because it tends to entangle interveners in complex entanglements. The evidence will be reviewed that shows that meddling repeatedly backfires. Even the best funded intelligence service dimly understands the shifting domestic politics of 190 other countries (Jervis 2010). Expressed another way, meddling in the domestic politics of others recurrently conduces to more variety in engagements with the politics of other countries than foreign states have the cognitive capability to manage. States struggle enough with managing the complexity of their own society. They do better to concentrate on getting the fundamentals of their own domestic institutions right, then cooperate with other societies on institution-building projects on which they enjoy shared agreement.

Across all four kinds of catastrophes, this book argues that ritualism in honoring international agreements is endemic. Hence, social movement activism that calls to account ritualism, duplicitous non-compliance with signed agreements, is simple and imperative. Across all kinds of catastrophes, the book argues that major powers place too much emphasis on containing states that are their competitors and insufficient emphasis on containing risks through early detection and early response.

None of this denies that nuance and sophistication in grappling with complexity is the essence of good scholarship and good policymaking. Simple-minded, oversimplified analysis is a hallmark of weak research and policy. Running a business or a society well is not a matter of getting

a handful of fundamentals right. There are usually more than a hundred variables to get right, or a thousand. In my future book, *How to Prevent War*, I argue that there are indeed hundreds of peacemaking variables to get right, but also generative priorities that are largely institutional. Most states can succeed most of the time in averting wars by taking seriously a hundred variables relevant to war prevention, making only limited progress on many of them. This is accomplished by prioritizing a shorter list of institutions and principles of war prevention that are sufficiently generative of improved circumstances for the society, and also for the society's potential enemies, to prevent entanglement in all kinds of wars.

Omitted variable bias is therefore a monumental constraint on social science that seeks to grapple with the complexity of a hundred causes of war or of ecosystem degradation. Statistical research in the social sciences cannot cope with causal models with a hundred explanatory variables. Omitted variable bias is controlled in randomized controlled trials, but they tend to explain weakly the complexity of a real world buffeted by a hundred relevant variables. This is even a problem in the hard science of pharmaceutical trials, where a randomized control trial of taking one little pill for an ill fails to tell us what happens in contexts where patients are forgetful about the regularity of pill popping or take it during a period when they consume alcohol, or when they have anxiety attacks. In addition to reliance on science, patients need support from a clinician who is diagnostic of the relevant kinds of complexity to cope with health challenges. For all the superiority of medical research as science compared to international relations as science, it cannot counsel us in detail on how to live a long life—as in exactly how much of which foods or drugs to consume as individuals. It can provide us with fundamental principles which are profound. University of Pennsylvania professor, Ezekiel Emanuel, articulates six ‘commandments of wellness’: eat a good diet, exercise, no smoking, wear a seatbelt, sleep, and socialize (Grose 2023).⁴ Most people can work wonders on their wellness by strengthening their commitment to those simple principles.

For the challenge of preventing war, *How to Prevent War* will argue that the practical research challenge is how to combine historical causal process tracing with quantitative research on many weak and

complex associations of a hundred variables, guided by fertile theories of warmaking. Which of these 100+ variables are most generative of multiple causal dynamics relevant to peace? These might help us constitute a finite suite of slow-food principles of peace comparable to Emanuel's commandments of wellness, some more specific, some of broad and generative import.

Diplomacy is an example of an institution vital to peace that Chapters 8 and 9 show does succeed in preventing many wars, has had many profound successes of disarmament such as the nuclear non-proliferation regime that persuaded the overwhelming majority of countries to spurn nuclear weapons, triumphs of ecological catastrophe prevention such as the Montreal Protocol on Ozone Depleting Substances that became an even bigger triumph when we learnt that ozone-depleting substances are also greenhouse gases, victories over pandemics, and economic crisis prevention. Yet I argue that these triumphs are balanced by many more failures than should occur because contemporary diplomacy is so duplicitous. It repeatedly spurns the principle of deep listening to adversaries. It is insufficiently relational, weakly committed to respectful relationships that apologize, forgive, and heal, that admit past lies.

A needed transformation to render restorative diplomacy more generative of problem-solving is a relational approach that understands why the data show the 'narrative of the broken promise' to be a recurrent poison in international affairs that festers war and tyranny. The Peacebuilding Compared data shows that of 73 armed conflicts since the end of the Cold War preliminarily coded so far, the narrative of the broken promise is a proximate factor motivating protagonists and an impediment to peace in 61 cases, in a major way for 41. For example, Western diplomacy is incapable of conceding fully and openly that Vladimir Putin and his predecessors were right when they complained that the United States and West Germany promised that NATO would not expand further Eastward after Moscow promised to facilitate the transfer of East Germany from being a member of the Warsaw Pact to reunification as part of Germany. This promise happened in the context of Gorbachev's move toward dismantling the Warsaw Pact and dismantling nuclear weapons stationed West of the Russian border. I document the detailed evidence for this in the book. The West could instead confess to broken promises,

not only there but also in implementing in good faith the 2014 Minsk agreement to make a ceasefire work for the first Ukraine war. That does not prevent NATO from arguing that Eastern European countries have the right to make their own decisions on what alliances they choose to join, a right to be free from foreign invasion, and from Russian domination as vassals of any Russian 'sphere of influence'. Instead, the duplicitousness of both Western and Russian diplomacy prefers to stigmatize scholars who point to a sordid history of broken promises and broken treaties. Scholars who remind the West of its lies are denigrated as apologists for war criminals. Or they are apologists for enemies of the forward march of Western civilization if they scold the West for systemic breaches of treaties with First Nations peoples.

Some of the essence of excellence in peacebuilding and in the prevention of diverse kinds of catastrophes is being able to identify fundamental principles and institutions. These constitute simple ways of imposing a better ordering of complexity. Deep listening is such a simple principle routinely neglected by brilliant scholars absorbed in working on the complexity of their thinking, their mathematical models, or the complex thicket of regulatory rules they write that entangle, trip up, the people they fail to hear. Deep listening is fundamental to that work by the clinician who helps patients respond to the complex circumstances of pills that do not work for them, or that interact adversely with something else in the life of one patient, even when the statistical evidence shows that in most cases the pills do help. Deep listening to stakeholders is a fundamental even more tragically underdone in international diplomacy than in medicine. Hence, however badly we do the science of comprehending complexity, deep listening to stakeholders has good prospects of improving on it. In medicine, randomized controlled trials support that conclusion (Young et al. 2011; Lundahl et al. 2013; Foy et al. 2010). In diplomacy, it is not possible to randomly assign different forms of diplomacy to crises, restorative diplomacy compared to punitive diplomacy, to discover when war results. It could never be ethical to decline to listen to an adversary when a crisis might lead to war. This book is about revealing different kinds of evidence that restorative diplomacy is principled and generative of a better way of living together to save this planet. Hence the quest of the book becomes to open up a journey of discovery of more

generative institutions like the profession of diplomacy, and more generative principles, like restorative diplomacy, that are principles that renew institutions to become more generative of a politics of survival.

The United States and China fail to cooperate with each other on principles as simple as delivering a 1.5 degree target on warming above pre-industrial levels (Zhang 2023). The persistent preference inside citadels of power is to pat fellow insiders on the back for their latest gaming of climate politics in pursuit of realist advantage that is only short-term. Such simple imperatives are neglected because political careers reap the short-term rewards from seeming to prevail in here and now politics of domination. Duplicitous denials of history's broken promises exemplify realist practices that can deliver short-term career triumphs to political practitioners of duplicity by burdening future generations with resentments in the hearts of enemies who hark back to their 'narrative of the broken promise'. It is naïve of today's practitioners of duplicitous climate diplomacy to deny that the Global South will exact formidable recompense against Northern descendants of the leaders who lie today. If the North does not pay up, its ability to keep dominating the Global South will be shot. A renewed non-aligned movement may then become more assertive and hopefully more transformative than the NATO alliance of Western privilege masquerading as Western democratic virtue.

AI's takeoff makes all of this more difficult. How can we possibly understand the complexity of thought in a universe of diverse AIs, each of which might soon enough become a thousand or a million times smarter than us at certain aspects of thinking? I have no idea how to answer this question. Things that seem simple today, like hiding from AI, tomorrow may be complex. The principle of requisite variety may help to manage the dialectics of complexity in some ways that are usefully simple. An immediate moratorium on AI development in weapon systems seems prudent, starting in more ethical universities and moving to the UN and treaties, until diplomatic and scientific conversations have diagnosed and proposed action on the character of AI risk. This could address the risk that AI weapons races will destabilize all equilibria concerning capability for mass killing in ways we cannot understand. This book does not discuss the specifics of how to regulate killer robots. It does propose a simple principle. This is that there is an

imperative for a restorative diplomacy toward consensus on international AI regulation. Second, the book implies that there will be a need for institutions to regulate AI. Third, meta regulation (regulation of regulation) of AI at different levels of governance is needed to temper power imbalances that AI could cascade. These simple solutions are implied by the policy proposals traversed.

Summary of Policy Propositions by Chapter

This book details how it is possible to marshal the evidence to begin the journey of taming the complexity of our most wicked catastrophes. Conclusions are summarized below so what I conclude to be the crucial policy propositions can be skimmed. Along that path, many empirical conclusions are also advanced. I aim to be practical about what might be done, and what might be refuted. Before the list of 48 policy conclusions by chapter, I organize them under four general principles:

1. First prioritize simple principles and simple institutions that prevent coupled catastrophes from cascading one to the other. The next step is to pursue requisite variety of responses by diagnosing dialectically when additional interventions will and will not add value for catastrophe control.
2. Prioritize peace, long-term commitment to total abolition of Weapons of Mass Destruction, and step by step progress toward abolition.
3. Cultivate restorative diplomacy for institutions to save the earth.
4. Temper abuse of power by institutionalizing responsive regulation and meta governance of catastrophic risk factors.

The Policy Hypotheses

1. When catastrophes move faster, wider, and cascade to coupled complexity, analysis paralysis and denial are understandable, but bad mistakes (This chapter).

2. After first prioritizing simple solutions that are low-hanging fruit, then pursue requisite variety in networked response to complexity (This chapter and Chapter 11).
3. Societies can refine slow-food cooking of crisis response plans, agencies, and training. A slow-food approach to growing simple institutions can be iteratively responsive to complexity. This is so when institutions are designed for capability to scale up during crises, to be generative, and to be evidence-based learning institutions that gradually accumulate wisdom to confront complexity (This chapter and Chapter 10).
4. Virtuous path dependency of regulatory preparedness, welfare preparedness, and market preparedness are needed for crisis responsiveness. Acting alone, strong markets that put a price on carbon fail to tame climate change without prosecution of carbon fraud and without state closures of power plants and carbon-intensive production lines (Chapters 3 and 10).
5. Because the big four catastrophes are increasingly coupled in cascades one to the other, good starting candidates for simple principles may be those that help with all four. An example is building a strong, independent university system (This chapter).
6. Prioritize institutions that are generative of problem-solving. Universities are generative of complex understanding of complex catastrophes. Generative institutions help discover requisite variety of policy response to complexity (This chapter).
7. Responsive regulation of powerful interests is imperative because organizational power games catastrophes. The military-industrial complex games war to sell weapons. High finance games tax and market rules to make the fabric of law more complex, widening gaps between rich and poor. Industrial capital games environmental enforcement and carbon pricing by carbon fraud, offsets fraud, and greenwashing. Big pharma games patents, monopolizing profiteering from pandemics, widening rich-poor health gaps (Chapters 3 and 10).

8. Build institutions of crime control that enforce the law against crimes that ignite catastrophe, such as carbon fraud, greenwashing, financial fraud, crimes against humanity, and extrajudicial political assassinations (Chapters 3 and 10).
9. Complex response to complex catastrophes is sometimes driven by inherent complexity. At other times, complexity can be regulated because it is contrived into markets. This happens when there is more profit in selling add-ons, band-aids, and workarounds than in simplifying (This chapter).
10. Peace is top priority for requisite variety of policy response to tightly coupled catastrophes because war so strongly conduces to economic crisis, environmental crisis, and epidemics. Societies at war disable collaboration on solutions to crises (This chapter to Chapter 4).
11. Humankind will not live long enough to make major progress on containing catastrophes without a strategy for banning Weapons of Mass Destruction, for responsive regulation of those who breach the ban, and tangible, measurable progress toward WMD elimination and international WMD inspection excellence (Chapter 4).
12. There have been three major spikes in risks of nuclear war: the Kennedy–Khrushchev spike (early 1960s); the mid-1980s (Reagan–Gorbachev); and the Biden–Putin–Xi spike. Tangible steps were taken with the first two toward nuclear weapons elimination. Prospects of that with the current spike are mired in failures of peacemaking in Ukraine, failed trade war prevention, and a statecraft of stigmatizing enemies (Chapter 4).
13. Extradition law reform is a strategy for super-intelligence and super-deterrence of WMD ban violators. State legislatures could enact laws that declare extradition treaties nullified for blowing the whistle on a WMD program that is in breach of international laws on covert WMD development. Whistleblowing WMD scientists could get asylum and distinguished positions in the world's universities. When nuclear powers frustrate disarmament, regional disarmament treaties can be grown. When a majority of states support a disarmament treaty, an option is collective disobedience to nuclear weapons

- states by respecting international law and protecting WMD whistleblowers from extradition into the talons of great power justice systems (Chapters 4 and 7).
14. Progressively dismantled mutual assured nuclear destruction (MAD) can be steppingstones to prevent Mutual Assured Digital Destruction (MADD) (Chapter 4).
 15. Restorative diplomacy, UN peacebuilding, and continuing to grow progress in transformation of punitive cultures are principles for peace (Chapters 4–9).
 16. Markets in virtue can help contain markets in vice that cascade to catastrophe. Markets in renewables illustrate the idea of a market in virtue. Active national and international civil society is pivotal to markets in virtue and to the governance of governance, nationally and internationally (Chapter 3).
 17. Governance of governance (meta governance) matters at many levels: the WHO governing pandemic responses of states and Big Pharma; states, professions, and trade unions governing corporate workplace safety policies; citizens standing up for their relatives in aged care when government inspectors fail to do their jobs (Chapter 3).
 18. Invading other countries is rare today. It does not pay. It has been an irrational practice at least since China's failed attempts to conquer Taiwan in the 1950s. The new empirics of warmaking effectiveness are conditions of modernity that give realist international relations theory less explanatory and normative power than it enjoyed from ancient times until the end of the Cold War (Chapter 4).
 19. Complete disarmament of 21 states during the 73 years since Costa Rica disarmed has paid dividends. It enticed not a single invasion. Apart from the United States, all the very wealthiest societies in GDP per capita are small, militarily weak societies. Small and unarmed can be beautiful so long as UN peacekeepers can be invited in. International society must rally around the right to remain disarmed (Chapter 4).

20. Permanent containment of crisis risks is good, permanent containment of states dangerous. Only temporary containment of states works; and it only works when combined with ongoing dialogue on what states must do to get containment lifted (Chapters 4–6).
21. Temporary re-containment of Russia makes sense at the time of writing because it wages a war of aggression in Ukraine. Likewise with Myanmar’s military junta until it restores democracy, releases elected members of parliament, ends the Rohingya genocide, and ceases waging war on its own people (Chapter 5).
22. A sequenced architecture of commitment can be a good way to strengthen peace agreements and confidence-building: You do A; then and only then we do B; when we do B, you do C; when you do C, we do D. Containment of threats can thus continuously improve. It can be a mistake to allow the perfect to be an enemy of the good with containment. Small arms containment successes build confidence for bigger challenges through sequenced architectures of commitment (Chapters 6 and 7).
23. Late twentieth-century drivers of declining armed conflict can be reenergized for future declines. These drivers include: reduced use of vetoes against peace diplomacy on the Security Council; expanded UN peacekeeping; care about excessively militarizing peacebuilding; more preventive diplomacy; more inclusive security architectures (that cease excluding China and Russia); embedding peace agreements more seriously; learning to better craft escape routes for refugees; investment in humanitarian intervention and civilian protection—human rights, gender rights; housing for refugees; poverty reduction; good governance; transitional justice; security sector reform, all rolled into multidimensional peace operation packages (Chapter 6).
24. Single thin reeds of war prevention snap, yet they work when local and international society invests to bind them together in a fabric of multidimensional peacebuilding (Chapter 6).
25. Regions and regional organizations like ASEAN and the African Union have avoided the historic pitfalls of European alliance structures that dragged the planet into world wars. Support other regions

- to continue rejecting military alliances, expanding nuclear-weapons-free zones, and restorative regional peace diplomacies (Chapters 6 and 7).
26. Just as market manipulators have progressively learnt new ways to game markets, over time democracy manipulators learnt how to game democracy. The best way to win elections was to misgovern. Earlier in democracy's evolution, the best way to win elections was to govern well. Democracy's virtues can be retrieved by investing in checks and balances that temper domination. Better democracies and better peacebuilding can help to build more robust separations of powers post-conflict (Chapter 6).
 27. Simple forest preservation and tree planting in evidence-based ways are vital to climate restoration, crime and war reduction, epidemic prevention, and therefore to financial crisis prevention (Chapter 7).
 28. Immediate diplomacy is needed toward guardrails among great powers on the use of AI in warfare and cyber-attacks that cross red lines. These can be steps toward treaties to regulate AI weapons and cyberwarfare (Chapter 7).
 29. Track II diplomacy options exist for great powers to persuade nuclear weapon states like Pakistan on why it is in their interests to show the way forward to adversaries by dismantling Pakistan's nuclear weapons (Chapter 7).
 30. An important kind of containment is of rogue states that threaten other states with nuclear weapons. Maximally large, temporary coalitions of states can reveal an escalating responsive regulatory pyramid that can invoke chokepoint trade sanctions and conventional military action by many states as a last resort at the peak of a pyramid that never needs to be used. The last resort is super-deterrence supported by many UN member states against the rogue WMD state and super-intelligence sharing on rogue WMDs (Chapter 7).
 31. Restorative diplomacy outperforms realist diplomacy today at preventing war, climate change, financial crises, and pandemics. Restorative diplomacy outperforms realist diplomacy in accomplishing long-run realist national interest objectives. Relentless determination of states to be more realist backfires as surely as

- individual determination to be more spontaneous. In most circumstances, the best way to win friends and influence states is communicating relationally a commitment to international human rights conventions with a reputation for shared support for a rules-based international order (Chapter 8).
32. Peacebuilding compared causal process tracing suggests narratives of the broken promise have been impediments to peace in 41 out of 73 armed conflicts. Restorative diplomacy must have an ethic of keeping its promises even when realist interests urge breaking them (This chapter and Chapter 8).
 33. Restorative diplomacy requires following the mentality of American Indigenous societies by ritualizing, deepening UN-ratified peace agreements, with regular commemorations at which statecraft speaks from the heart, apologizes and forgives past slaughter, builds new commitments atop a growing architecture of peace, and ritualizes collective memory. Restorative diplomacy sets itself against transactional peace agreements conceived as contracts that rich countries can later buy their way out of (Chapter 8).
 34. Learn restorative diplomacy lessons from the Marshall Plan. Put deposits, financial and emotional, in the banks of old adversaries (Chapter 8).
 35. Learn restorative diplomacy lessons from spymasters like South Africa's Niël Barnard. Spies are not diplomats; they cannot be fully restorative. As South African history teaches, however, they can be more restorative and therefore more competent than spies currently are. Projects like South African nuclear weapons destruction, Africa as a nuclear-weapons-free continent, release of Mandela, Apartheid abolition, and peace spreading across southern Africa illustrate (Chapter 8).
 36. At the micro level, restorative justice can help reduce and heal drug addiction; at the macro level restorative diplomacy can achieve more for preventing epidemics of drug abuse, particularly through restorative and responsive regulation of the interface between war and drug commercialization (Chapter 8).

37. AI weapons and space war must be more transparently and responsively regulated by nuclear surety regulatory regimes that embrace audit by foreign technical teams (Chapter 9).
38. Head-of-state and head-of-military hotlines between adversary states are keys to last resort diplomatic paths from war. North Korea needs them (Chapter 9).
39. Meddling in the politics of other countries induces blowback, terrorism, and war. Many states do not meddle in the politics of other states; all states should commit to never doing so, especially not by violent means like assassinations, plotting coups, arming insurgents. Respecting democracy development by never interfering in another country's elections is in the long-run national interests of states that spurn meddling (Chapter 9).
40. Relentless civil society activism is a remedy to the ritualism of states promising big and delivering poorly on crisis amelioration (Chapter 10).
41. Regulation must be a human, relational craft. Centralized bureaucracies that over-prioritize desk audits and risk measurement that dates quickly as it feeds into algorithmic regulation are a risk. Detective skills and relational skills of street-level inspectors must be re-prioritized (Chapter 10).
42. Regulators around the world can achieve more if they learn to collaborate with one another at being cosmopolitan. Regulators can use national enforcement threats to demand global compliance improvements under the shadow of the axe of deferred prosecutions (Chapter 11).
43. Early detection and early response are imperative with fast-moving risks (Chapter 11).
44. Principles for a dialectics of requisite variety are: (a) Prune and strengthen rules; (b) Transform jurisprudence so fundamental principles justify rules, yet trump rules; (c) Shift away from automaticity of enforcement of rules, algorithmic or human, to a restorative diplomacy of rule enforcement of peace agreements, environmental stewardship, virus containment, and stewardship of financial systems (Chapter 11).

45. Rally behind front-line workers of crisis prevention institutions before burnout spreads. Every citizen gets opportunities to show admiration for front-line risk containment workers. There are inspiring contributions little children and the frail aged can make to honoring first responders to catastrophes (Chapter 11).
46. Restorative and responsive diplomacy is a more promising theoretical foundation for international relations than realism (Chapters 3, 9, and 10).
47. Minimally sufficient deterrence is a more promising theory of deterrence of states, more powerfully consistent with contemporary facts, than any theory of nuclear deterrence (Chapters 6, 9, and 10).
48. The most important thing about choosing between simple and complex networked solutions is not to choose. Think dialectically about the dynamics of sequencing those choices (Chapter 11).

Notes

1. Greenspan was Federal Reserve Chairman for two decades to 2006. He was a revered until the crisis. Greenspan said in 2008 that he erred in not insisting on more regulatory distrust in banks: ‘I made a mistake in presuming that the self-interests of organisations, specifically banks and others, were such that they were best capable of protecting their own shareholders and their equity in the firms’ Greenspan (2008).
2. The source is mostly cited as Henry Louis Mencken’s 1920 book, *Prejudices*. However, different versions of the quote are attributed to differing talks and newspaper writings of Mencken, Mark Twain, and twentieth-century business gurus, particularly Peter Drucker.
3. The John Rawls (1999) methodological principle of reflective equilibrium is useful here. When our considered reflections on the virtue of a new rule opens up an inconsistency with a settled principle, we should open ourselves to a debate on tweaking that principle to restore reflective equilibrium between the principle

and the rules. In tax law, that means the appellate courts or the legislature adjusting the principle.

4. Quoted in Grose (2023).

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