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Complex Adaptive Systems in a Contentious World

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Abstract

This article is about developing and implementing interventions that are systemically viable in a world that is constantly evolving. Geopolitical and economic forces, environmental stressors, and the weaponization of information confront us with an unprecedented level of complexity, requiring new ways of seeing and being when intervening in conflictual situations. I draw on the Complex Adaptive Systems paradigm to explore how world order emerges from the dynamics of network relationships between the players in the cyber-social landscape. This treatment elaborates on mechanisms underpinning resilience, adaptation, and transformation of socioeconomic systems in turbulent contexts. It emphasizes a need to reconsider conventional logics and mindsets. In its final analysis the article suggests that world leaders need to choose whether to persist in defending the international rule-based order or to embrace network thinking and create conditions under which each country can find a sustainable niche in a global ecosystem.

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The name of Lord Alderdice’s Centre for the Resolution of Intractable Conflict is perhaps the most compact and communicable encapsulation of my motivation for writing this article: there is a need for innovative ways of thinking that take us past conflict to spaces more amenable to giving peace (and peaceful co-existence) a chance. Beyond this imperative is a growing, collective realization that the interplay between geopolitical and economic forces, environmental stressors, and the weaponization of information confront us with an unprecedented level of complexity, requiring new ways of seeing and being in the world.

Two things are clear: in the networked world, local actions can have unintended consequences with systemic impacts, and the nonlinear network mode of transmission exponentially increases the speed with which undesirable effects are propagated across the world. Isolationism is no longer a viable strategy—addressing the challenges of the networked world entails understanding the relative positioning of players in the ecosystem, and the networks that connect them. The “shocks” that threaten global order and stability are diverse, their origins complex, and their antecedents and causes open to interpretation. The unfeasibility of future-proofing against all possible “assaults” brings to the fore the importance of resilience and the capacity to adapt and transform in the face of destabilizing influences.

For those concerned with the resolution of conflict, the complexity and dynamism of this emerging world give rise to increased uncertainty and unpredictability about the consequences of actions and interventions. The focus of this article is the mode of thinking and discourse that accompanies (or even constitutes) interventions aspiring to resolve or de-escalate conflict, or to restore stability post conflict. It addresses the problem of how to go about developing and delivering interventions that are not irrecoverably “wrong” in the face of unfolding events and their representations on digital media. It uses concepts from Complex Systems Science and the study of Complex Adaptive Systems to explain how adaptability and resilience can be built into the process of developing and implementing interventions that are systemically viable in the longer term, in a world that is constantly evolving.

The study of Complex Adaptive Systems in the biological sciences provides much of the inspiration for new thinking to advance our understanding of the mechanisms underpinning the collective behaviors and systemic phenomena displayed by social systems and the quest for greater resilience in today’s turbulent world. Of particular relevance when looking for ways for civil society to survive and evolve in turbulent times is the resilience of these systems.

The most powerful insight from the study of Complex Adaptive Systems is that the network form of organization and communication underpins the ability of systems to adapt and evolve, overcoming adverse conditions and improving fitness for survival in a changing landscape. Social systems are essentially networked systems, and intervention in the trajectory of war or peace requires an understanding of how the structure and dynamics of networks give rise to the phenomenology of both disruption and stabilization. A failure to understand the networked nature of social systems has two significant consequences for politicians and peacemakers:

- they fail to leverage the power of networks and network capabilities for developing creative, sustainable paths for conflict avoidance/resolution and
- they fail to anticipate the strategies and impact of opponents who do understand how to use networks.¹

This article advocates a paradigm shift from a *Weltanschauung* predicated on the protection of boundaries to one predicated on harnessing the power of networks. The next section introduces the relevant concepts from Complex Systems Science and examines the mechanisms underpinning resilience, adaptation, and transformation of Complex Adaptive Systems in turbulent contexts. This treatment elucidates the mechanisms for realizing the power of the network form of organizing, the importance of diversity, and the role of information and

communication. The sections that follow show how these generic characteristics afford the requisite scaffolding for understanding the emergence of social phenomena across networks straddling the embodied world and cyberspace. The final sections reflect on the utility of this way of thinking for guiding discourse in the development of interventions to resolve conflict.

Complex Adaptive Systems

Complex Systems Science is an umbrella term for the endeavors of scientists from different disciplines to develop plausible explanations for the emergent behavior over time of complex systems, that is, network systems that comprise large numbers of variously interconnected diverse components.² The complexity of structure and composition and the nonlinear dynamics of the interactions between components makes it difficult to precisely predict the behavior and state of the system at a given future point in time: hence the popular saying that the whole (system) is more than the sum of its parts. Of particular relevance for this article is the Complex Adaptive Systems paradigm derived from the study of biological systems that display resilience or generative potential (e.g., by developing new features) under changing environmental conditions.

A viable Complex Adaptive System is

- an open system: it interacts with its environment;
- an adaptive system: it is able to adapt to changes in its environment and to co-evolve with its environment (the adaptation may result in the maintenance of a steady state, or it may entail a transformational process and the acquisition or generation of novel characteristics) and
- a self-organizing system: the interactions of the components of the system are contingent on the characteristics of individual components and what they know about their environment: there is no *deus ex machina*, no central entity or locus of control to predetermine the actions of individual components.

The phenomenology of a Complex Adaptive System is characterized by its emergence: the diversity and dynamics of the relationships between its components give rise to macro-level properties (i.e., those that we can observe when we describe the behavior and characteristics of the system as a whole), which are different *in kind* from the sum of the properties of its individual components.

These fundamental properties of Complex Adaptive Systems hold for systems at all scales, from individual micro-organisms to entire ecosystems. Social systems can also be viewed as Complex Adaptive Systems. The observable macro-level collective behavior of social systems is an emergent phenomenon, arising from the interactions and behaviors of individual, locally situated actors based on only the information and knowledge they can access from where they are. The financial crisis of 2008, the trajectory of the COVID pandemic, the materialization of the gig economy, the evolution of QAnon, the storming of the US Capitol on January 6, 2021, and the evolution of the war in Ukraine are all examples of emergent macro-level phenomena. In all these instances, causality cannot be attributed to a simple chain of events: there is a concatenation of factors and context-sensitive dynamics that give rise to the observed phenomenology.

The discipline of systems thinking is concerned with understanding the mechanisms that underpin the emergence of such macro-level, systemic phenomena from the locally situated, micro-level properties, relationships and behaviors of the components of a system. The emergence and resilience of Complex Adaptive Systems is predicated on their heterogeneous composition and network form of organization.³ The next sections provide an overview of this

dynamic and the way it plays out for social systems that extend across the embodied world and cyberspace.

Network Signature of Complex Adaptive Systems

Heterogeneity and Dynamism

In its most abstract definition a network is a set of nodes connected by links: in a social network, the nodes could be individuals and the links would be the relationships between them. Generically, social systems can be said to comprise dynamic networks (or networks of networks) with

- many heterogeneous actors or agents (individuals, institutions, governments, social movements, etc.)
- interacting with each other and their environment through a variety of relationships (including positive and negative feedback loops) and
- producing, consuming, or exchanging a variety of goods and resources (material, informational, sensory, aesthetic, etc.).

The complexity of a Complex Adaptive System arises from the combinatorial potential afforded by

- the heterogeneity and diversity of its components and the types of relationships between them;
- the dynamic characteristics of the components and their relationships, including
 - changes in the number and type of nodes in the network,
 - changes in the nature and states of individual nodes, and
 - changes in the number and nature of links between nodes; and
- the dynamic and often transient content of the information held and exchanged within the network and externally, over time.

The network is characterized by nonlinear dynamics, allowing rapid propagation of changes across the system.

Resilience: Latent Capacity, Adaptation, and Transformation

The heterogeneity, diversity, and dynamic features of the network form of organizing make the network the locus of a vast combinatorial potential. The selective activation of particular patterns of connectivity, in particular sequences, results in the emergence of the adaptations or transformations observed in Complex Adaptive Systems.⁴ The network is thus endowed with latent capacity—particular constellations become active as and when appropriate, according to the information and conditions to which individual nodes respond. The collective activity can either serve to maintain the overall system state as it was, or it can be generative, giving rise to a qualitative change, with new attributes that allow the system to shift to a different mode of existence or to display and exercise new capabilities.

The transformational shift is achieved without loss of internal coherence of the system, and this is the hallmark of resilience: for social systems we can think of it as the ability to contend with environmental disruptions without the loss of integrity.⁵ While the dynamically configuring network topology and the selective activation of network constellations provide the mechanisms of transformational change, the coherence of the “whole” is predicated on the

network as a co-ordination mechanism, maintaining the integrity of the “whole” by functioning as a decentralized, distributed control network.⁶

All of this behavior is contingent on the generation and transmission of information between network nodes: collective behavior emerges from the way in which individual nodes communicate and act on the information that they can access. While the network structure enables the exchange of information between nodes, nodes are also able to pick up information about their local milieu directly through physical contact, and their internal processes can generate new information.

The features introduced here are generic for all Complex Adaptive Systems. The next section examines how the understanding of social systems as Complex Adaptive Systems advances our exploration of the mechanisms and conditions for the emergence of solidarity or fragmentation in the internet-enabled world.

Social Systems as Complex Adaptive Systems: Making Sense of the Cyber-Social World

Viewing Social Systems through the Information Lens

While there are several different schools of thought about the ontology and epistemology of the social world, connectedness and communication are fundamental properties of any recognizable form of social organization. This holds equally for social organization across physical space and cyberspace: a social system can be viewed as a sophisticated information network where relationships (links) connect social actors (nodes) that are able to communicate with each other (information exchange). Transitive relationships (through friends of friends, etc.) afford extensive reach to distant actors. The nonlinear connectivity afforded by the network form allows rapid propagation of information and change across the network. This basic network motif is elaborated by the emotional, embodied, and cognitive dimensions of human relationships and communication. An even more interesting and challenging picture emerges if we incorporate the degree to which this network of human actors is either augmented or disrupted by emerging technological artifacts and capabilities.

Understanding the network structure allows one to comprehend the potential reach or spread of things that originate in a particular place. In the connected world, it has been shown that any two individuals are separated only by a chain of five or six intermediaries.⁷

Structurally, a social system can be represented as a network of networks, comprising interconnected clusters of varying sizes. The clustering may be based on homophily (birds of a feather flock together) with strong ties between individuals due to kinship, shared values, and beliefs or common purpose, but as Mark Granovetter points out, there is also strength in “weak ties” between dissimilar agents because they can provide access to different, complementary, or novel resource pools.⁸ Individuals who can connect across clusters as boundary spanners or bridges can also be powerful gatekeepers for such exchanges. Connectivity in these networks is “lumpy”: there will be relatively few highly connected agents (e.g., celebrities and media influencers) or network “hubs,” and many with far fewer connections.

Recent experience with COVID highlights the importance of attending to the network structure and the significance of the lumpy distribution of connectivity. A failure to immunize the most connected individuals at the start of the pandemic coupled with the nonlinear dynamics of contagion made it significantly more difficult to contain the spread. Effective strategies for isolation of communities rested on the identification of infected clusters and severance of their links with other clusters. The pandemic also highlighted the importance of weak links and the danger of ignoring individual behaviors. Because of the network effect, small players can have a very large impact if they are connected to large social hubs: a single

infected traveler arriving at a densely packed international airport can set off a snowballing dynamic with fellow passengers carrying the infection far and wide.

The dynamics of the spread of information through social networks follows the same basic pattern as the spread of the virus in a pandemic. In the case of infectious disease, however, the infected host tends to be regarded as a passive recipient and transmitter of the virus. This is not true for the communication networks of social systems: here, senders and recipients play an active role in shaping the nature and meaning of the transmitted information, and in directing the path and extent of its propagation across the population. Once information is “out” in the network, the sending node has little influence on the path and extent of propagation.

Social Complexity

None of the individuals in a social system have complete knowledge of the entire network, and they are all susceptible to conditioning by their diverse social and cultural environments and backgrounds, their personal experiences, and events and information about events from their immediate environment and their extended networks. The network thus embodies both a degree of path dependency (history matters) and a spontaneous departure from the past.

Individuals learn and they forget. Social groups may have established rituals but they also succumb to fads and fashions. Inventions may lead to sweeping innovations or they may disappear unnoticed. No overall design can predetermine exactly how the network will be at any particular time: the observed properties of the “whole” come about as a consequence of bottom-up interactions, the precise nature of which may not be predicted in advance.⁹

Informational Complexity: Representations of the “Real” World, Solidarity, and Fragmentation

Information transmitted in a social network is defined by the senders’ selection and articulation of the informational content and the recipients’ interpretation of the “message” and its import. Different people receiving the “same” message may propagate a variety of interpreted versions. They may also amplify, embellish, or attenuate the message. The potential information complexity arises from the variable connectivity of the network and from the multiple and distinct versions of the information transmitted through the network.

At the collective level, social networks have always functioned as filtering and selection mechanisms for information, with intersubjective enquiry validating and legitimizing opinions. This may be a social strategy for lowering the cognitive load and decreasing search costs by relying on the opinions (recommendations, reviews, etc.) of others through the network. Technological advances have enabled a step change in global connectivity (between people, applications and devices). Because of the reach, range, and speed of information transmission, we are increasingly dependent on other peoples’ representations of distant places and events.

Consequently, rather than evaluating the “raw data” or first-hand experience, one needs to decide whom to trust. Mediated reports are inevitably selective, constructed accounts of the real world. The creation of a representation requires selection of the salient features describing the situation as it is perceived from the particular vantage point of the sender. Similarly, interpretation of the representation is shaped by the sense-making apparatus and state (intellectual, moral, emotional) of the recipient.

The increased variety and volume of available information challenges the human capacity for analysis, fueling the adoption of data science and artificial intelligence to furnish semantic, algorithmic, and computational capabilities to make sense of it all. Over the past millennium we have shifted from making decisions based on direct observations of the world to dealing with others’ representations of possible worlds. The “others” who shape our choices may be humans or algorithms and computer-generated bots. The penetration of social media into the

fabric of society allows access to real time, first-hand accounts of events and situations in distant locations. Equally, it provides the opportunity to introduce manufactured accounts, misinformation, and disinformation.

Solidarity and Fragmentation: The Weaponization of Information

Social media platforms and services are a fertile substrate for developing echo chambers with homophilic networked clusters, with siloed communities subscribing selectively to particular narratives and representations. The global reach and networked structure of platforms allows amplification and morphing of narratives, continually incorporating new material (real or manufactured) introduced by human or artificial agents, possibly aided by algorithmic profiling and matching of content to recipient. The result is the emergence of robust, persistent narratives within communities secure in their self-affirming beliefs.

Weaponization of information exploits the network dynamics to propagate destabilizing narratives. The success of conspiracy theories lies in the art of splicing fact and fiction to construct narratives tailored to fit the interpretive frames of the communities in which they take root. Stories that begin on the fringes of society can be disregarded as “noise” by mainstream media, but planted in fertile communities they become potent signals picked up, amplified, and extended, harnessing network effects for propagation and renewal. Different clusters may develop home-grown variations to resonate with extant belief structures, and these become articulated into the meta-narrative in a complex web of cross-referenced accounts.

Gabriel Gatehouse’s investigation of the trajectory of QAnon illustrates the power of harnessing networks for disruptive ends.¹⁰ QAnon’s evolution from conspiracy theory to political movement was realized by harnessing network effects and the generative capacity of distributed network clusters attaching to a well-orchestrated narrative. QAnon maintained an evolutionary dynamic for its narrative by continually incorporating new dimensions generated by the diverse clusters, interfacing with multiple adjacent areas of interest. New stories were spliced in, and seemingly unrelated events given semiotic meaning. Pronouncements that clearly contradicted real-world experience were taken as allegorical or retained as coded messages that would reveal their true meaning when the time was right.

The resulting metanarrative was a multidimensional entity, providing points of attachment and ownership for different communities: antivaxxers, MAGA (Make America Great Again) adherents, the gun rights movement, and many more. What emerged was a hyper-network connecting clusters across the United States and abroad. Individual clusters were driven by different elements of the meta-narrative and were mobilized as a coherent network of networks. The cascading network effects culminated in the collective storming of the Capitol in Washington, DC, on January 6, 2021.

As demonstrated by the QAnon story, there is no boundary separating the cyberworld from the physical world—for those caught up in in the movement, the cyber-social is an integrated space of existence with palpable, physical relevance. An important and possibly overlooked factor contributing to the entrenchment of the narrative is the visceral, addictive aspect of engagement with messaging and posting on sites. Narratives in cyberspace morph faster than things can change in the physical world: new external events are reinterpreted and re-presented in an evolving storyline.

Belief in a particular narrative strand leads people to act as if it were true. In turn, that changes the state of affairs in the physical world. The danger for societal stability is that once they have penetrated the grass-roots communities, complex conspiracy theories are difficult to dislodge, because counter-narratives face the challenge of overcoming a Lernaean Hydra.

Gatehouse’s account is useful for understanding social movements as Complex Adaptive Systems. It demonstrates the leveraging of network effects, expansion into the adjacent possible,¹¹ generation of latent capacity, and adaptation to the cyber-social environment. A

significant signal of the movement's resilience is the post-insurrection survival of the meta-narrative and the progress of its adherents in entering mainstream politics at a local level to reshape the Republican Party.

Role of the State

In the sea of misinformation, disinformation, and conspiracy theories, it is advisable for democratic countries to ensure that civic society is educated to be discerning about knowledge claims that confront them. One approach could be along the lines of Charles Sander Pierce's pragmatism—when it comes to knowing the truth, all we have access to are plausible explanations for observed phenomena, and those we choose to believe need to be tested intersubjectively.¹²

Democracies become vulnerable to conspiracy theorists when they shield their populations from hearing the full accounts as presented by governments in hostile countries. The Western media's selective representation of the "other" is undermined when the inquiring citizen's attempts to understand the root causes of strife are satisfied only by turning to social media platforms biased toward the "other."

Even more damaging is the marginalization from mass media of critical commentators who question the orthodox logic of the Western stance in situations of conflict.¹³ Having the option to hear controversial views and question their veracity empowers the citizen, and to be denied that opportunity in a civilized society is disenfranchising. The absence of intelligent debate is debilitating when it takes away the civic mechanism for developing the societal apparatus for evaluating information, testing the coherence of policies and values advanced by their own politicians and diplomats and the diverse views acquired from social media.

Social media and the conventional press play an important, positive role in the rapid expansion of social justice movements and in enhancing the visibility of environmental activists. The freedom for civil society to have a voice in the fight against injustice and environmental degradation speaks to the strength of democracies. However, alongside this is the incipient rise of a coercive "cancel culture" that ostracizes and seeks to silence individuals who do not conform to the new orthodoxy of political correctness.¹⁴

In academic institutions, this new orthodoxy denies students the opportunity to develop skills for critical discourse by engaging in intellectual debate, and academic freedom is curtailed. For example, globally, scholars who criticize Israel's human rights abuses in Palestine are themselves under attack, charged with anti-Semitism.¹⁵ The threat of retribution has also precipitated greater risk aversion among writers, artists, and journalists, who fear for their livelihoods if they depart from the consensus or even lack sufficient zeal in agreement.¹⁶ Fundamentally, cancel culture endangers freedom of speech: as argued by Noam Chomsky, if we don't believe in freedom of expression for people we despise, we don't believe in it at all.

Freedom of speech without the capacity to reason cannot be effective in setting the moral compass of the free world, whereas the thoughtful use of discourse and dialogue in an open society has a critical role in delivering interventions that address the intractable conflicts of our times. The next section reflects on the utility of the Complex Adaptive Systems paradigm in shaping such interventions.

Resilience of the Discourse

Resilience, Adaptation, and Transformation

Talks are indispensable in the avoidance, de-escalation, or resolution of conflict. The challenge often lies in getting adversaries to engage in constructive talks, often over an extended period. When talks break down, unresolved conflicts can escalate and the consequences can extend

and evolve to become reference points for future battles. The imperative is thus to ensure the resilience of the discourse so it doesn't break down irreparably.

This section takes the Complex Adaptive Systems perspective to reflect on the dynamics of talks and the means of ensuring their resilience. Particularly relevant to the discussion that follows are three traits of Complex Adaptive Systems:

- the emergent nature of systemic phenomena,
- the ability to access the adjacent possible, and
- the ability to maintain internal coherence while adapting and transforming in a dynamic environment.

Traditional Mindsets and Their Limitations: Fragmentation and the Logic of Boundaries

Much of the language of world leaders challenged by conflictual situations suggests a *Weltanschauung* predicated on brinkmanship and the binary logic of boundaries: clear battlefronts, well-defined demands, red lines that are not negotiable, and so on.¹⁷ Boundaries are thus treated as the demarcators of difference, things to be breached or defended. The intractable problems of our time are often articulated within this mindset, inhibiting the exploration of the potential points of commonality and positive exchange that may exist in the liminal space. Focusing on boundary issues can lead to oblivion about the unintended consequences, including the systemic impact of decisions on the lesser players across the web of relationships that make up the wider ecosystem. This aspect is discussed in the next section with respect to recent affairs in Afghanistan.

Boundary mindsets privilege robustness over resilience: the ultimate aspiration is for invincibility in the face of threat. Players who have historically occupied dominant positions depend on the robustness of boundaries to maintain their security. Consequently, their response to uncertainty is to bolster their military to extend and reinforce the boundaries. This response can, in turn, lead to insularity and diminish sensitivity to the needs of others on the international front. Domestically, the heavy investment in the military-industrial complex drives underinvestment in the requisite civil infrastructure for resilience in the face of pervasive global stressors such as pandemics or climate change.¹⁸

Geopolitically, boundary logic promotes consolidation of economic and military power in the dominant players, who are invested in developing robust mechanisms for extending and protecting their own spheres of influence. This logic maintained the global order in the Cold War era, though not without significant cost to less powerful countries who were obliged to align with one of the superpowers—or become embroiled in proxy wars or regime change. That proves to be a brittle arrangement, sclerotic in addressing the emergent challenges of today's complex and dynamic networked world. Escalation of the current war in Ukraine, for example, exposes the predicament of polarized positions and the cost to humanity of investing in war. Significantly, it highlights the failure of the dominant players to effectively promote discourse as a way of countering polarization and fragmentation in the lead-up to the war.

Even when talks are initiated, it is not unusual to reach an impasse because the adversaries have become locked into a framing of the problem that confines the solution space within excessively tightly defined bounds. The discourse becomes focused on what each party can concede to, or wrestle from, the other, often colored by expectations set in past encounters. Such a reduced discursive frame makes for a brittle structure: it limits the possibility of shifting the discourse to a more tractable space for transforming the relative positions, perceptions, and attitudes of the parties.

The Complex Adaptive Systems paradigm and network thinking provide a way of escaping the constraints of the boundary mindset and open up the option space for conceptualizing possible futures that allow for the peaceful co-existence of difference.

Leveraging the “Networkness” of Networks

Discourse as a Productive Intervention

From a systems perspective, because of the interconnectedness of our world, conflicts have the potential to destabilize the socioeconomic and political ecosystem within which they arise. Cascading network effects may lead to more serious consequences of the kind currently witnessed with the war in Ukraine.

Consequently, it is advisable for adversaries and mediators to take a holistic systems view if they are to arrive at “solutions” that offer the possibility of achieving a sustainable fit with the wider ecosystem. The Complex Adaptive Systems perspective and the information lens allow for the development of a composite view of the perceptions that adversaries bring to the table; network thinking enables expansion and exploration of the option space for developing potential pathways that might lead to resolution.

Discourse as a Complex Adaptive System of Communication

A systemic perspective, treating the discourse as a complex adaptive system of communication entails broadening the scope and relaxing the framing of the discourse so that one is simultaneously attending to the matter that the parties consider to be at the heart of the dispute and its representation in the contextual space (i.e., the information space). This enables realization of the generative potential conferred by virtue of its being open and having access to the latent potential of the network as a locus of option generation.

Capturing the Evolutionary Dynamic of the Discourse

Viewing the discourse through an information lens allows the development of a network representation of its evolutionary dynamics, effectively capturing the changing landscape of issues, concerns, and ideas as they surface and evolve. Mapping the changing landscape in terms of the dimensions (attributes of the conflictual situation and its context) of the discourse and the relationships between them makes visible the possibilities that exist for shifting the discourse into the adjacent possible.

The Network as a Locus of Option Generation

In the “network of networks” that constitute our interconnected world, bounded entities such as countries and institutions are defined as clusters comprising strong, densely connected internal networks, with sparser connections of varying strength (and duration) to other clusters. The dimensions of connectivity may be seen as relationships or dependencies of various kinds (economic, ideological, political, ancestral, religious, etc.)

Thus, there are multiple potential dimensions of connectivity and also possible transitive relationships—alliances through “friends-of-friends.” Conflict is associated with fracturing relationships on particular dimensions; intractable conflict is symptomatic of an apparent impossibility of repairing the fractured link.

Fractured relationships and conflict between pairs of countries can, through network effects, escalate to have a destabilizing impact on the wider global system. The Complex Adaptive Systems approach to talks does not merely arrive at a settlement based on a shopping list of demands and concessions from each side. It requires that talks be placed in the context

of the ecosystem in which the adversaries operate if they are to generate solutions that improve the overall systemic stability.

The conditions under which conflict emerges are often the result of cumulative historical experiences and a concatenation of contemporary stressors and actions. The context includes history and the diverse narratives it spawns, as well as the contemporary systemic context within which talks are taking place. Consequently, it is incumbent upon the brokers and facilitators of peace talks, and the adversaries to recognize and articulate their relative positioning within the ecosystem that they are part of. Discourse and dialogue provide the space to do this and to explore whether old links can be resurrected or how other (possibly as yet unactivated) dimensions (or combinations of dimensions) can be brought into play to improve the situation.

The Generative Capacity of the Present

The Complex Adaptive Systems perspective entails appreciating that the present is the locus of the generation of possibilities for the next stage. This idea is experienced in the creative arts: Miles Davies referred to it when he said “It isn’t that the note you just played is right or wrong. It is the note you play next that makes it so.” What “makes it so” is finding a dimension of fit between the note just played and the one chosen to come next from the space of existing possibilities. Playing the next note creates a new space for the sound to evolve without destroying the integrity of what came before: the system has moved into an “adjacent possible”

Accessible adjacent possibles are not infinite: history matters, and there is path dependency. The note one just played matters because the next note should fit with it. For social systems, the past cannot be undone or erased, and one has to start from the now, that is in the present state of affairs.

In the context of talks, moving to the adjacent possible is about discovering or generating new dimensions for framing the discourse and shifting to a new space where constructive engagement is possible. A useful way of accessing this dynamic is through understanding the emergence of features in the networked communication landscape.

Exploring the Option Space

Understanding the space of possibilities for the development of network relationships allows identification and exploration of the dimensions of potential “fit” and a shift to the adjacent possible. Continuing with the Miles Davies analogy, in moving the discourse to an adjacent possible, finding a dimension (or set of dimensions) of fit is an exploratory process, dependent on the conditions that prevail. The number of notes one can access affects the options that one has for new combinations to emerge. Significantly, the new space may contain harmony or discord as consequences of the choices made. The same rational applies to the chances of finding ways of moving to a better discursive space: excessive constraints on the content of the discussions or the elimination of particular actors from talks limits the available option space for shifting the discourse to a viable adjacent possible. For example, excluding Hamas from Israel-Palestine negotiations makes finding a viable option impossible.

Extending the scope of any discourse increases the available option space. Practitioners in the field highlight the importance of creating a space for dialogue (in both the physical and the abstract sense) in uncovering or discovering viable dimensions of fit.

Graham Spencer and Padraig O’Malley demonstrate the importance of listening in conflict resolution.¹⁹ They advocate engaging in “tender conversations,” where the conversational space provides an open-ended framework, a kind of scaffolding to support participants in traversing the liminal space as they shift to the adjacent possible.²⁰ This practice embraces the notion of conversation having a fluidity that avoids competition and enables participants to be

architects of their own solutions through listening and talking. The adjacent possible is uncovered in the intersections between concerns and interests.

Real Options Thinking

Relationships and trust take time to emerge and develop, and the shift to an adjacent possible state of connectivity carries with it an element of risk. Consequently, it may be easier to engage adversaries in a process that allows for a graceful transition into a desirable future state by using a form of the economists' real options thinking: investing relatively small amounts in different options for the future, where for each option the choice exists for further investment at a future time, or abandonment.²¹ The will to invest is a powerful signal of commitment to peace, and the real options approach furnishes a means by which the option space exposed through discourse can lead to a de-escalation of conflict even if the realization of peace is some way down the line.

As exemplified at the August 2021 Baghdad summit, this kind of thinking also has the potential to enhance the stability of regional ecosystems where pairs of countries have fallen out with each other along diverse axes of difference. The summit, hosted by Iraq, was aimed at easing tensions in the Middle East. It brought together heads of state (or senior representatives) from nine countries (Egyptian, Jordan, Qatar, Kuwait, the United Arab Emirates, Iran, Saudi Arabia, Turkey, and France) with the overarching ambition of creating a future regional network for improving the stability of the region as a whole.

The summit succeeded in initiating conversations between rivals, creating a space for forming exploratory alliances with weak network links between players, based on mutual interests. This effort could be a precursor for a regional network of countries that have their differences but constitute a coherent collective, connected by an assortment of links based on the particular interests of parties at each end of the link. The strategy of making exploratory weak links between rivals is akin to real options thinking for investments: it allows countries to make a modest investment in an option that can be called in when the context is favorable or abandoned if hostile conditions prevail.

Iraq's efforts to set the stage for the gradual emergence and extension of regional stability resonate with the Complex Adaptive Systems paradigm: all Complex Adaptive Systems survive when they find a "fit" with their local context. A good analogy for countries that want to co-exist and compete is the biological ecosystem that is made up of diverse communities organized around a network of mutual dependencies, with groups of species co-evolving in time and space.²² Individual species occupy specific niches, and heterogeneity and differentiated structure embodied in the whole network underpin the maintenance of stability, co-evolution, and generative potential over time.

Transformational Mindsets: Displacement versus Replacement

The ability of Complex Adaptive Systems to maintain internal coherence while adapting and transforming in a dynamic environment is remarkable in its efficiency: very small innovations in the make-up of a system can have transformational impact conferred by

- the ability to deploy dynamic, selective network connectivity across the system in shifting to the adjacent possible, coupled with
- the capacity for actuating an exponential increase in the speed and extent of transmission of changes afforded by the network form of organizing.

Retaining coherence enables the graceful displacement of an old state or order with a new one without destroying large parts of the infrastructure. Using the Complex Adaptive Systems perspective to reflect on contemporary military campaigns suggests that

- aspirations for “regime change” through military conflict are based on a mechanistic logic of replacement, and
- there is some merit in considering an alternative approach based on the naturalistic logic of displacement.

The Naturalistic Logic of Displacement

Complex Adaptive Systems in biology are remarkably parsimonious: often, new traits displace old ones without requiring the *ex ante* destruction of old structures. Many important adaptations to changing environmental conditions are accomplished rapidly through the gene regulatory system coordinating the switching on and off of particular genes, without altering the genome. Similarly, longer-term evolutionary processes retain vestigial organs though their original function has ceased to be relevant.²³ This conservative approach provides a useful point of reference for exploring contemporary political approaches for bringing about large-scale transformation of social systems.

The key requirement is retention of internal coherence within and between different levels of the system throughout the transformational process. This retention is achieved through coordinated changes in the network structure and dynamics connecting the system’s components as it moves from one state to another. What may look like a spontaneous step change to an external observer is actually delivered through an elegantly executed assemblage of internal interactions. Under this paradigm, for social systems, citizens are the “components” of the system, the process of change resides with civil society, and generative change is rooted in resilient grass-roots networks.

The Mechanistic Logic of Replacement

The conserving approach of biological Complex Adaptive Systems stands in stark contrast to the mechanistic logic of replacement that characterizes the attempts of powerful global players to bring about the transformation of countries that they judge to be offensive. Recent decades have witnessed numerous efforts to effect regime change—military campaigns and proxy wars designed to remove incumbent hostile rulers and replace them with more acceptable ones.

The mechanistic logic of replacement, like the boundary mindset discussed earlier, is inadequate for dealing with social systems as Complex Adaptive Systems. Its rational is consistent with a machine metaphor, where all components are “black-boxed” with discrete interfaces, and it is possible to take out a faulty control unit and replace it with one that will function better.

The machine metaphor does not cater for the generative characteristic of Complex Adaptive Systems: like biological systems, social systems comprise intricately connected networks that interact dynamically to retain their integrity through the transformation process, maintaining the coherence of connections between the micro- and macro-scales of organization, and conserving the generative potential (and thus the resilience) of the system.

Under ordered regimes, including authoritarian rule, civil society comprises a resilient network that allows it to survive within the cage of restrictions imposed by the regime. Military campaigns tend to destroy extant networked infrastructures. Invasions of the kind witnessed in Iraq and Afghanistan not only destroy the physical infrastructure and resource base of a country, they also destroy the social support mechanisms and workarounds developed by civilians to withstand the harshness of an ordered regime.

Afghanistan: The Two Logics at Play

Consider the current situation and future options for the Islamic Emirate of Afghanistan from a Complex Adaptive Systems perspective: up to August 2021, the US-led invasion, the installation of the Afghan Interim Administration, and the establishment of the constitution of the Islamic Republic of Afghanistan followed the mechanistic logic of replacement. Little attention was paid to the consequences of cleavage between the administration installed in Kabul and the diverse rural populations: the country remained fragmented. Following the US withdrawal in August 2021, the Taliban returned to power, constituting the de facto government. There are competing logics about how the United States and its allies, and various international organizations (e.g., the United Nations, the World Bank) should address the plight of the Afghan population.

Within the boundary mindset and the logic of replacement, it is a matter of standing up for democracy against authoritarianism. Consequently the Taliban government is not to be recognized as legitimate, and the way forward is through imposing sanctions to force the Taliban to comply with demands for a more liberal government. Afghanistan's offshore central bank reserves are frozen, international banking relationships are disrupted because of sanctions, and all nonemergency aid has been halted. With this mindset, the impact of these measures on the civilian population is seen as collateral damage, regrettable but necessary in the global fight for democracy.

An alternative, development, mindset focuses on Afghan civil society and the systemic impact of the sanctions policy. While money is gradually being released for humanitarian aid, the sanctions-driven incapacitation of the banking system and shortage of circulating banknotes obstructs the ability of public sector institutions and aid agencies to pay local workers and businesses for services and goods.²⁴ David Miliband refers to this situation as precipitating a humanitarian and economic "catastrophe of choice."²⁵ The humanitarian cost is detailed in his testimony to the Senate Foreign Relations Committee Subcommittee on Afghanistan and includes mass malnutrition and loss of livelihoods and life;²⁶ the collapse of the banking systems means that civilians do not have cash to purchase food or medicines. The development mindset advocates a change in policy that goes beyond the provision of aid for crisis relief, committing to investment in creating conditions under which efforts of aid agencies, businesses, and public sector workers can connect up to restore the resilience of civil society.

The development mindset is consistent with the Complex Adaptive Systems perspective in recognizing

- the importance of diversity and of working with the different communities and institutions that have survived the past twenty years of war,
- the multidimensional character of viable societies and the intersectionality of economic, social, and material factors,
- the necessity of attending to economic, social, and environmental aspects simultaneously for the enhancement of place-based well-being, and
- the need to establish the requisite conditions for the emergence of an ecosystem that leverages the complementarity of public, private, and third-sector investment and capabilities for sustainable development.²⁷

The sanctions policy closed the option space of those who remained in Afghanistan to work with the Taliban to create transitional networks. Sustainable change in the trajectory of Afghanistan requires international leaders to shift to an adjacent possible where aid and investment are connected with the grass-roots mechanisms for sustaining civil society. The restoration of agency to individuals to rebuild their livelihoods and reestablish place-based social support networks is the foundation for the emergence of a confident civil society.

From a Complex Adaptive Systems perspective, the process needs to be evolutionary, allowing connected individuals and institutions the scope to create and explore the option space for realizing the generative potential of the network. The pathway to achieving this requires diplomacy and discourse to identify and create options that would enable the country to achieve the United Nations' sustainable development goals in a coherent fashion.²⁸ Refusing to talk to the Taliban eliminates the possibility of exploring the option space that this would open up for the emergence of a more liberal society.

The Afghan experience is a reminder that beginning a war brings with it the challenge of knowing when and how to end it gracefully, avoiding the wastefulness of attrition or annihilation. Speculation about how the current war in Ukraine will end is beyond the scope of this article. However, when the hurly-burly's done, when the battle's lost and won, the future will be shaped by the discourse that follows.

The positioning of countries such as the United States and the United Kingdom in finding paths to peace depends on the trust they hold and the option space that they are able to access. The next section reflects on some of the challenges that may become important in defining that space in the cyber-social context.

Future Challenges

Discourse in Liberal Societies: Values and Their Representation

Seasoned statesmen understand the inherent complexity of human affairs and are able to knowingly choose between the different logics and mindsets to suit vested interests and expediency; they articulate their position in a coherent fashion. What they are less able to do in the internet-enabled world is control how their narrative is appropriated and interpreted in the press and social media.

Media Effects

With conventional mass media the danger is one of becoming locked into the editorial trope of particular outlets. Interpretations and representations of politicians' pronouncements and world events project the editorial *Weltanschauung*. The public tends to be aware of the political affiliations of different media corporations, and this kind of channeling is relatively transparent: the critical reader can cross-check diverse accounts for consistency.

Complex systems dynamics and network effects become more problematic when it comes to social media. The same mechanisms that allowed the QAnon conspiracy theory to morph come in to play. Diverse interpretations and representations woven into complex narratives (often without rigorous fact checking) can leverage network effects to spread and become embellished in siloed echo chambers. Advances in technological capabilities for cyber warfare and the weaponization of information have the potential to distort the value of free speech in democracies.

Back to the Forum

Echo chambers and conspiracy theories spawned on social media, coupled with the weaponization of information, promote fragmentation of society, as proponents of diverse narratives battle to establish theirs as the dominant one. The role of independent journalism to function as the Fourth Estate has been eroded by commercial pressures, and the independence of public-sector broadcasting is compromised by threats of political interference.²⁹ Some observers have warned of a crisis of democracy in the United Kingdom and the United States, with the decline of trust in politicians and government as a key indicator.³⁰

To the extent that conspiracy theories and viral misinformation campaigns distort the public perception of government, there is a need to consider options for mitigating their systemic impact on democratic discourse. Governments cannot stop the generation of divergent narratives in social media echo chambers, but they can explore the option space for creating an adjacent possible by extending or even shifting the discourse to an open democratic forum.

Echoing Pierce's assertion about knowledge claims in science, in the cyber-social world, all we have are plausible explanations for observed phenomena: these should be tested rigorously through intersubjective enquiry. For democracies to regain confidence they need to create a space for such enquiry, to interrogate competing narratives alongside independently verified facts. The restoration of a healthy, independent media ecosystem is a way of making and holding such a space. Organizations like Bellingcat highlight the essential role played by independent journalism in safeguarding freedoms and holding democratic and authoritarian governments to account, demonstrating the effectiveness of critical inquiry in making sense in the information jungle.³¹

The extent to which technologies enable whistleblowers to furnish verifiable accounts of malfeasance and state terrorism is problematic for democracies, as it endangers their democratic narrative. The case of Wikileaks and the subsequent treatment of Julian Assange is an important milestone for two reasons. First, Wikileaks confronted citizens of democratic countries with the violation of human rights carried out in their name. It made visible the gulf between what democracy stands for and what democratic countries do, and thereby detracted from the political narrative that sustains Western propaganda. Second, the consequent incarceration and treatment of Assange are violations of his human rights.³² For journalists, this action signals impunity for governments acting to silence investigative journalism and the free press.³³ This impunity is more exposed in the wake of the ineffectual international response to the murder of Jamal Khashoggi (a critic of the regime in Saudi Arabia) in 2018 and, more recently, the murder of Shireen Abu Akleh (covering the Israeli occupation of Palestine) in May 2022.³⁴

Democracies have the difficult task of balancing the need for transparency, to enable public evaluation of state actions, against the risks of damaging national security. In the networked world, the power of advanced forensic data analytics can be used to expose misdemeanors on all sides. This points to the need for a more nuanced framing away from the "democracy versus authoritarianism" narrative, to open up the option for governments to operate in the liminal space between these two pure forms.

Diplomacy in the Post-Ukraine World Order

Throughout history, conflicts have been framed as dualities of values or beliefs (Protestantism versus Catholicism, Christendom versus Islam, communism versus democracy, and so on), consistent with a boundary mindset. While the "democracy versus authoritarianism" mantra (and the adversarial stance it signals) has been effective in uniting the United States, the United Kingdom and Europe against Russia in Ukraine, its suitability for statesmanship and diplomacy in a post-Cold War world order is contested. In his interview with the Financial Times, speaking on the US position, Henry Kissinger advised against lumping Russia and China together as a single element, or of "stating the adversarial position as the basic element of the relationship."³⁵

At the time of writing, the war in Ukraine is in its third month, and the rhetoric of "democracy versus authoritarianism" prevails, but the global geopolitical landscape does not conform to this binary division. Many countries in Asia find it expedient to maintain an ambivalent stance because they have concurrent ties with the United States, China, and Russia. China and Russia are both extending their soft power and commercial networks in Latin America and in Africa, where interest from the United States and the United Kingdom appears

to be waning.³⁶ In these regions, the emerging networks of alliances are multidimensional, and their strength and persistence is predicated on pragmatic considerations, not determined by ideology. Commentators experienced in the realpolitik of the Cold War believe the dynamic between superpowers will shift to a differential approach, with alliances of expediency formed as and when they relate to particular issues of common interest.

The general direction of travel appears to be toward a new global order defined by dynamic network relationships. For democratic states, retention of internal stability and integrity in the dynamic network rests on a resilient civil society able to hold the government to account. This requires that the populace appreciates the international geo-political landscape, and has the critical ability to interrogate the news received through the diverse media sources (as discussed earlier, independent journalism has a critical role).

Effective statesmanship requires leaders to understand the global, systemic consequences of their actions and their inaction: the macro-level behavior of the world system emerges from the relative positioning and interactions of all players. The emergence of hyper-networks in which countries can have links with more than one superpower may have a stabilizing effect and serve to moderate the tendency for polarization.

Conclusion

The concatenation of technological advances with man-made and natural challenges accentuates our complex, networked existence. Operating in this setting requires a systemic perspective and an understanding of the networks that generate global phenomena. The Complex Adaptive Systems paradigm furnishes the requisite conceptual apparatus for understanding how the world order emerges from the dynamics of the network relationships between different players. For strategists, it provides the scaffolding for understanding how networks can be harnessed to accommodate dynamism without losing stability, and maintain coherence without sacrificing diversity.

It presents leaders with a choice—whether to create super-hubs that resemble the old blocs, sequestering and using military and economic force to coerce less powerful countries to be “with us or against us” or whether to embrace network thinking and create the conditions for each country to find a comfortable niche in a global ecosystem. Lessons from the science of Complex Systems and biology suggest that, in dynamic contexts, the former strategy runs the twin risks of being brittle and of stunting the generative capacity of the global ecosystem. The latter, allowing for resilience, opens up options for conserving the planet and our place on it.

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Notes

¹ Osama bin Laden's mastery of network organization underpinned Al-Qaeda's resilience and effectiveness in the lead up to 9/11. Al-Qaeda's original architecture with its co-ordinated orchestration of distributed cells and resilient financing and logistics networks is versatile and resilient in comparison to Daesh's monolithic design.

² For a detailed review of Complex Systems Science and its relevance to socioeconomic systems in the networked world see Yasmin Merali, "Complexity and Information Systems," in *Social Theory and Philosophy of Information Systems*, ed. John Mingers and Leslie Willcocks (London: Wiley, 2004): 407–446.

³ Yasmin Merali, "Complexity and Information Systems: The Emergent Domain," *Journal of Information Technology* 21 (2006): 216–228.

⁴ In this context connectivity between two nodes is "activated" if there is communication between them in one or both directions. A "pattern" of connectivity refers to the particular constellation of connected nodes that is activated.

⁵ "Integrity" is used here in the same sense as Durkheim's concept of the "conscience collective."

⁶ One of the most elegant examples of this type of dynamic organization and decentralized control is the regulatory system for the selective expression of genes resulting in different outcomes under different conditions. The activation of constellations spawning a nonlinear expansion of activity and discernable network pathways results in observable phenomena.

⁷ Duncan J. Watts, *Six Degrees: Small Worlds and the Groundbreaking Science of Networks: The Science of a Connected Age* (New York: W. W. Norton, 2003).

⁸ Mark S. Granovetter, "The Strength of Weak Ties," *American Journal of Sociology* 78, no. 6 (1973): 1360–1380.

⁹ Merali, "Complexity and Information Systems."

¹⁰ Gabriel Gatehouse, *The Coming Storm*, produced by Lucy Proctor, BBC podcast, 8 episodes, December 20, 2021; January 4, 2022; February 22, 2022, <https://www.bbc.co.uk/programmes/m001324r/episodes/downloads>.

¹¹ The "adjacent possible" is the space of possibilities that can be accessed from the current position.

¹² Charles Sanders Pierce, *Pragmatism and Pragmaticism*, vol. 5 of *Collected Papers of Charles Sanders Pierce*, ed. Charles Hartshorne and Paul Weiss (Cambridge: Harvard University Press, 1934).

¹³ See, for example, Chris Hedges, "'Disappeared': Chris Hedges Responds to YouTube Deleting His 6-Year Archive of RT America Shows," *Democracy Now*, uploaded April 1, 2022, YouTube video, 10:18, <https://www.youtube.com/watch?v=V1LU-nV11dg>.

¹⁴ Pippa Norris, "Cancel Culture: Myth or Reality?," *Political Studies*, August 1, 2021, 00323217211037023.

¹⁵ Jasmin Zine, Greg Bird, and Sara Matthews, "Criticizing Israel Is Not Antisemitic—It's Academic Freedom," *The Conversation*, published online November 15, 2020, updated April 20, 2021,

<https://theconversation.com/criticizing-israel-is-not-antisemitic-its-academic-freedom-148864>;

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¹⁶ "A Letter on Justice and Open Debate," *Harpers Magazine*, signed by 153 public intellectuals, published online July 7, 2020, <https://harpers.org/a-letter-on-justice-and-open-debate/>.

¹⁷ A typical example of *Weltanschauung* predicated on brinkmanship and the binary logic of boundaries is President George W. Bush's post 9/11 speech in which he said, "Every nation, in every region, now has a decision to make. Either you are with us, or you are with the terrorists." "Bush: 'You Are Either with Us, or with the Terrorists'—2001-09-21, Voice of America, October 27, 2009, <https://www.voanews.com/a/a-13-a-2001-09-21-14-bush-66411197/549664.html>.

¹⁸ President Dwight D. Eisenhower's two speeches "Chance for Peace" (April 16, 1953) and "Farewell Address" (January 17, 1961) spell out the dangers of escalating America's investment in its military-industrial complex at the expense of strengthening the infrastructures for the development of civil society. Miller Center Presidential Speeches, <https://millercenter.org/the-presidency/presidential-speeches/april-16-1953-chance-peace>, <https://millercenter.org/the-presidency/presidential-speeches/january-17-1961-farewell-address>.

¹⁹ Graham Spencer and Pdraig O'Malley, "The Importance of Listening in Conflict Resolution," talk delivered at CRIC 2021 Conference, Oxford, September 20, 2021.

²⁰ Kathryn Mannix, *Listen: How to Find the Words for Tender Conversations* (London: Harper Collins, 2021).

²¹ Richard A. Brealey, Stewart C. Myers, and Franklin Allen, F. (2008) "Brealey, Myers and Allen On Real Options," *Journal of Applied Corporate Finance* 20 (2008): 58–71.

²² For a detailed description of biological ecosystems, see Yasmin Merali, "Complexity and Networks," in *Rethinking Leadership for a Green World*, ed. Andrew Taylor (New York: Routledge, 2022).

²³ Examples cited by Charles Darwin in *On the Origin of Species by Means of Natural Selection* (London: John Murray, 1859) include wisdom teeth and the appendix in humans. The human appendix is an interesting example, because, though it is much reduced in size when compared to that of our herbivorous ancestors and it is no longer important for its original role in digestion, recent research reveals that it does play a role in our immune system. This is yet another example of the conserving quality of biological Complex Adaptive Systems, and its role in the immune system illustrates the low marginal cost of retaining redundancy in networked systems with the distributed organization of functionality.

²⁴ The import of \$8.5 million worth of Afghan banknotes from the Polish printing press that has the contract has been blocked by fears of falling foul of the sanctions regime. “Let Innocent Afghans Have Their Money,” editorial, *New York Times*, January 14, 2022, <https://www.nytimes.com/2022/01/14/opinion/afghanistan-bank-money.html>.

²⁵ Patrick Wintour, “West Has Inflicted Catastrophic Damage on Afghanistan, Says David Miliband,” *Guardian*, February 20, 2022, <https://www.theguardian.com/world/2022/feb/20/west-catastrophic-damage-afghanistan-taliban-david-miliband>.

²⁶ International Rescue Committee, “David Miliband’s Testimony to the Senate Foreign Relations Committee Subcommittee on Afghanistan,” news release, February 9, 2022, <https://www.rescue.org/press-release/david-milibands-testimony-senate-foreign-relations-committee-subcommittee-afghanistan>.

²⁷ For a discussion of the importance of the complementarity of public, private, and third sector investment, and an explanation of the dynamics underpinning, see J. M. Njihia and Yasmin Merali, “The Broader Context for ICT4D Projects: A Morphogenetic Analysis,” *Mis Quarterly*, 2013, 881–905.

²⁸ See Merali, “Complexity and Networks” for a network-based development approach that harnesses the generative potential of civil society to realize the UN’s sustainable development goals.

²⁹ Emily Bell, “The BBC Faces Major Challenges from the Government to Its Independence,” *Guardian*, July 20, 2021, <https://www.theguardian.com/commentisfree/2021/jul/20/the-bbc-faces-major-challenges-from-the-government-to-its-independence>.

³⁰ “Public Trust in Government: 1958–2021,” Pew Research Center, May 17, 2021, <https://www.pewresearch.org/politics/2021/05/17/public-trust-in-government-1958-2021/>; Sarah Davidson, “Loss of Public Trust in Government Is the Biggest Threat to Democracy in England,” Carnegie UK (blog), January 21, 2022, <https://www.carnegieuktrust.org.uk/blog-posts/loss-of-public-trust-in-government-is-the-biggest-threat-to-democracy-in-england/>.

³¹ Bellingcat’s investigative journalism specializes in fact-checking and open-source intelligence, focusing on conflict zones, human rights, and crime.

³² “UK: Refusal by Supreme Court to Grant Assange Right to Appeal Is ‘a Blow for Justice,’” Amnesty International, March 14, 2022, <https://www.amnesty.org/en/latest/news/2022/03/uk-refusal-by-supreme-court-to-grant-assange-right-to-appeal-is-a-blow-for-justice/>; Nils Melzer, “Demasking the Torture of Julian Assange” (blog), June 26, 2019, <https://medium.com/@njmelzer/demasking-the-torture-of-julian-assange-b252ffdc768>; Doctors for Assange “End Torture and Medical Neglect of Julian Assange,” *Lancet* 395 (2020): e44–e45, <https://www.thelancet.com/journals/lancet/article/PIIS0140-67362031444-6/fulltext>.

³³ Peter Osborne, “Extraditing Julian Assange Would Be a Gift to Secretive, Oppressive Regimes,” *Guardian*, May 20, 2022, <https://www.theguardian.com/commentisfree/2022/may/20/extradite-julian-assange-investigative-journalism-wikileaks>.

³⁴ Martin Chulov, “Turkish Prosecutor Asks to Halt Trial for the Murder of Saudi Critic Jamal Khashoggi,” *Guardian*, March 31, 2022. <https://www.theguardian.com/world/2022/mar/31/turkish-prosecutor-asks-to-halt-trial-for-the-of-saudi-critic-jamal-khashoggi>; Zeena Saifi, Eliza Mackintosh, Celine Alkhaldi, Kareem. Khadder, Katie Polglase, Gianluca Mezzofiore, and Abeer Salman, “‘They Were Shooting Directly at the Journalists’: New Evidence Suggests Shireen Abu Akleh Was Shot Dead in Targeted Attack by Israeli Forces,” video by Livvy Doherty and Oscar Featherstone, *CNN*, May 26, 2022, <https://edition.cnn.com/2022/05/24/middleeast/shireen-abu-akleh-jenin-killing-investigation-cmd-intl/index.html>.

³⁵ “Henry Kissinger ‘We Are Now Living in a Totally New Era,’” interview conducted by Edward Luce, in Washington, DC, May 9 2022, uploaded May 12, 2022, YouTube video, 22:52, <https://www.youtube.com/watch?v=6b89jcNqgJo&t=48s>.

³⁶ James Landale, “Foreign Aid: UK Cuts Funding to UN in Change of Strategy,” BBC News, May 16, 2022, <https://www.bbc.co.uk/news/uk-61466163>.