



This beautiful fractal explaining the sea is an educational interpretation of a “Mandelbrot set.” PHOTO BY DASARTS/SHUTTERSTOCK

*Complexity, Organizational Blinders, and the SOCOM Design Way* (SDW) takes on the monumental task of explaining why the complex world is so difficult to comprehend and provides a way for navigating through it. The authors accomplish this utilizing U.S. Special Operations Command design techniques. This monograph is not just for the Special Operator or the Operational Planner. It is useful for anyone who is seeking out a better way to address problems that seem to have no solution. Dr. David Ellis and Mr. Charles Black provide the tools necessary to define the problem and develop an approach. The SDW needs to be seriously considered and put into practice if the community desires to make progress in complex and wicked problems.

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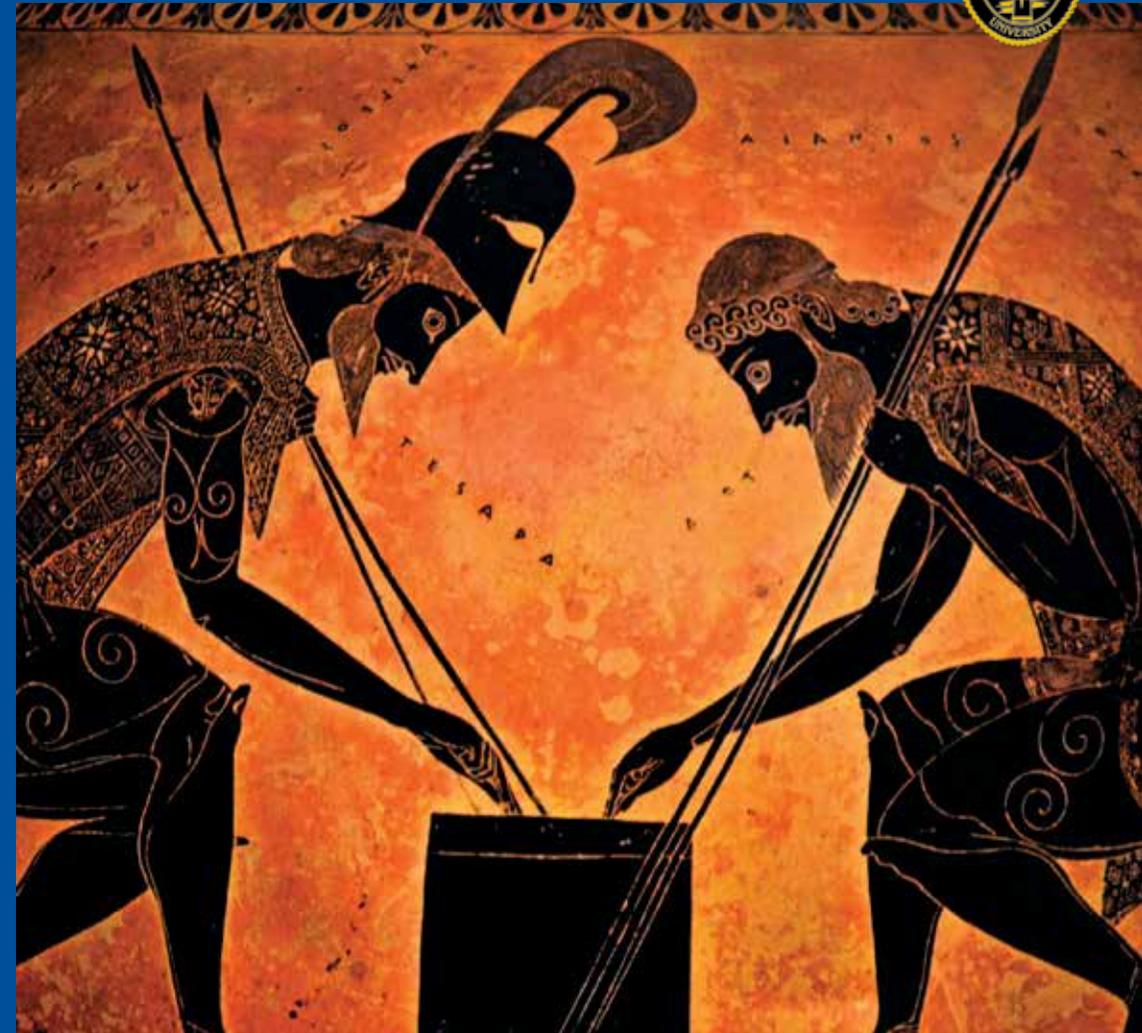
JSOU Report 18-3

*Complexity, Organizational Blinders, and the SOCOM Design Way*

Ellis and Black



**JOINT SPECIAL OPERATIONS UNIVERSITY**



## ***Complexity, Organizational Blinders, and the SOCOM Design Way***

David C. Ellis and Charles N. Black

JSOU Report 18-3



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*Complexity,  
Organizational Blinders, and  
the SOCOM Design Way*

*David C. Ellis and Charles N. Black*

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**On the cover.** Detail from the Exekias Vatican Amphora dated 530 B.C. depicts Achilles, on the left, playing a game with Ajax. PHOTO BY WORLD HISTORY ARCHIVE/NEWSCOM

**Back cover.** This beautiful fractal explaining the sea is an educational interpretation of a “Mandelbrot set.” PHOTO BY DASARTS/SHUTTERSTOCK

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## From the Director

Many strategic level national security assessments of the operating environment or international arena describe conditions as complex, uncertain, wicked, or some other adjective implying “too hard to figure out.” Operational design, systemic design, design inquiry, and design thinking are only a few terms in vogue as innovative ways to look at problem sets and contemplate the situation or circumstances differently. Dave Ellis and Charles Black tackle this topic with examples, vignettes, and clearly defined key terms to make the concepts more digestible and understandable.

The bulleted summaries at the end of each chapter are a nice touch, but do not expect to only consume those summaries and understand the total picture—it is just too complicated a subject to be reduced to a PowerPoint-like consumable. Enjoy this and our other JSOU publications.

Boyd L. Ballard  
Director, Center for Strategic Studies



# Foreword

**D**r. Dave Ellis and Mr. Charles Black’s *Complexity, Organizational Blinders, and the SOCOM Design Way* takes on the monumental task of explaining why the complex world is so difficult to comprehend and provides a way for navigating through it. The authors accomplish this utilizing U.S. Special Operations Command design techniques. It does not matter if the reader is familiar with these design concepts. Ellis and Black are successful at keeping the narrative from getting too “heavy” but at the same time challenging the reader to think “differently.” This text might even encourage the reader to sign up for a design course or two.

There are many blinders keeping the U.S. military and the Special Operations community from achieving success or even realizing progress in current operations. This monograph tackles many of these blinders (personal and organizational). The authors provide the tools to address complexity and “wicked problems.” One technique is to *Appreciate the Context*. Since any one individual or organization cannot comprehend all the dynamics of a system—only those aspects informed by their experience and bias—the SOCOM Design Way (SDW) advocates for teams working together with divergent perspectives to truly appreciate the context.

This monograph challenges the reader to think systemically vice in a linear fashion. This concept is important because it leads to a *Range of Possible Futures* instead of an end state. This might seem like heresy to a professional military education school-trained planner but it provides the planner with other solution sets that would not be possible using linear thinking. The reader is also challenged to re-conceptualize the nation-state paradigm. The military views the state as the source of power which leads to planning frameworks that reinforce those blinders. The design methodology espoused by the authors provides the reader with different ways to perceive social organization and power. Hopefully, the SDW can lead to better approaches to address complex and wicked problems.

This monograph is not just for the special operator or the operational planner. It is useful for anyone who is seeking out a better way to address problems that seem to have no solution. Ellis and Black provide the tools necessary to define the problem and develop an approach. The tendency

will be to revert back to the traditional paradigms and linear thinking and, while it might be easier, it would be a mistake. The SDW needs to be seriously considered and put into practice if the community desires to make progress in complex and wicked problems.

Peter M. McCabe, Ph.D.  
Resident Senior Fellow, Center for Strategic Studies

## About the Authors

Charles N. Black is the co-founder and managing partner at Xundis Global, LLC, which specializes in navigating complexity through creative and reflective application of design, strategy, and planning to realize favorable futures. Mr. Black is a retired Marine Corps officer with over 26 years of diverse leadership, planning, and operational experiences with conventional, special operations, and coalition forces. He is a founding member of the JSOU Design Thinking Program and frequent subject matter expert facilitating design inquiries for the SOF enterprise.



Dr. David C. Ellis is a Resident Senior Fellow at the Joint Special Operations University. He holds a doctorate in international relations and comparative politics from the University of Florida, a master's degree in international development with a specialization in international marketing from The George Washington University, and bachelor degrees in international studies and Spanish from Jacksonville University.



Dr. Ellis's research on democratization and development in identity conflict spans over two decades. His interests in peacekeeping, conflict resolution, development, and atrocity in ethnic conflict focused his doctoral research on identity, social movements, organization and social learning theory, and economic growth theory. Dr. Ellis served as an All Source Intelligence analyst in USSOCOM's J2 JICSOC from 2009-2013 and established its Socio-Cultural Awareness (SCA) section. His research interests at JSOU focus on the opportunities for USSOCOM to become a learning organization through design thinking applications and more robust socio-cultural analysis for intelligence, planning, and operations.



# Acknowledgements

The concepts presented in the following pages result from the combined experience and education of four veterans of the special operations enterprise: Major Tracy Moss (United States Air Force, Retired); Lieutenant Colonel Charles Black (United States Marine Corps, Retired); Lieutenant Colonel Chris Phelps (United States Marine Corps, Retired); and Lieutenant Colonel Rick Newton (United States Air Force, Retired), Ph.D. While design thinking has been part of United States Special Operations Command (USSOCOM) since 2006, its original systemic operational design form proved difficult to disseminate across the headquarters and was not often suited to the intrinsically bureaucratic problems encountered by action officers. By distilling the theoretical essence of design thinking into a pragmatic, experience-based, and accessible series of principles, Moss, Black, Phelps, and Newton created a framework and educational platform that personnel across the special operations enterprise have found useful, exciting, and in many ways liberating. The authors dedicate this monograph to the inspired team effort that went into the creation of the SOCOM Design Way.

In composing the monograph, friends and colleagues have been supremely insightful. Special gratitude is extended to Dr. Peter McCabe and Dr. Paul Lieber for their critique, encouragement, and recommendations for keeping the text accessible. Substantive contributions to content and practical experience were provided by Tracy Moss; Lieutenant Colonel Tom Searle, USA (Ret.), Ph.D.; Lieutenant Colonel Michael Manning, Rhode Island National Guard, Master Sergeant Tom O'Hare, Master Sergeant Michael Cutone, and Sergeant Brian Beliveau (Springfield, MA). Whether they know it or not their influence permeates the text and is greatly appreciated. Brenda Oppermann and Lieutenant Colonel Wes Howard (United States Army, Retired) generously gave their time to read early drafts and helped shape key portions. Without the love and support of family, endeavors such as this are impossible. For the long nights and absent weekends, special thanks go to Sonya and Charlie Black, and Neisy, Gabriela, and Isabela Ellis. Of course, all errors and omissions in the text are solely the fault of the authors.



## Introduction

The gods must be crazy; it is the only explanation. At the time of this writing, the Taliban in Afghanistan remain a persistent threat after 15 years of combat,<sup>1</sup> the Islamic State in Iraq and Syria (ISIS) holds large swathes of territory in the Middle East with a growing number of regional franchises popping up from Africa to Southeast Asia,<sup>2</sup> and the U.S. military supports a Shiite-dominated Iraqi military poised to retake Mosul in parallel with Iranian-backed forces just five years after the U.S. triumphantly departed Iraq.<sup>3</sup> At the same time, the U.S. military—Special Operations Forces (SOF) in particular—control the most elegantly lethal counterterrorism (CT) force in the history of warfare. How in the world is this possible? Something does not seem right, and the force knows it at the gut level. One thing that is not wrong is the heart of the force. It wants to get it right, and it wants to win.

The following pages offer a conversation about the unconscious assumptions that take SOF down the wrong path. The purpose is not to offer a silver bullet or claim to fix all of the problems of SOF. Rather, the purpose is to explain why the complex world is so difficult to comprehend and provide a way for navigating through it. In short, from elementary school on Americans are taught certain ways to see, understand, and predict events around them. The military specifically, and the United States Government (USG) more broadly, reinforces many of the schoolhouse lessons that shape how world events are framed.

The fact that reality is interpreted through frames means some things are inherently included, and more importantly, others are inherently excluded. The dominant frames that exclude others are here labeled “blindners.” Blindners are natural. Everyone has them—the authors certainly do. Acknowledging the existence of blindners is not to diminish anyone’s intelligence. It simply means: (a) people have limits on what they can possibly know in life, (b) their jobs require them to focus on just a few ways of interpreting and reacting to events, and (c) their infinitesimally small number of social interactions in the grand scheme of humanity constrains their ability to empathize with others. No judgment; it just is.

For United States SOF the implications of operating and thinking with blindners are magnified by the nature of some special operations core

activities. Unconventional warfare (UW), civil affairs (CA), and military information support operations (MISO) activities<sup>4</sup> all require a higher degree of empathy for or appreciation of foreign populations than is expected of most other military activities.<sup>5</sup> It is the responsibility of SOF to become more self-aware about their blinders and work to overcome them to the best of their ability.

Unfortunately, in 2001 SOF were thrust into an unanticipated CT war, and they adapted in the best way they knew how—take the fight to the enemy and hunt it down. While initially adaptive and successful in the use of UW approaches against the Taliban in Afghanistan and Saddam Hussein’s regime in Iraq,<sup>6</sup> SOF soon became focused on the direct action (DA) and foreign internal defense (FID) missions to disrupt and degrade terrorist and insurgent networks.<sup>7</sup> Since 2004, SOF have predominantly exercised their skills on the surgical strike end of the core activities spectrum either in a DA or FID capacity.

Sixteen years at constant, high-paced war does something to people and institutions. It forces them to adapt quickly, amplify positive feedback, train to perfect the positive feedback, execute, and then repeat the cycle year after year. The problem is that the whole concept of positive feedback is itself a frame rooted in unstated assumptions. What if the frame and unstated assumptions emphasize the wrong elements? What if updated standard operating procedures (SOPs) and doctrine accentuate measures of performance instead of measures of effectiveness (MOE)? The authors believe blinders in SOF have had this very effect, which is why so many look around now thinking the gods must be crazy.

## **Why Design Thinking?**

Army General Joseph Votel, Commander of USSOCOM 2014-2016, recognized in 2015 that the decade long CT fight by SOF had begun to homogenize SOF capability. He noted, “The SOF Enterprise needs to think critically and challenge current and often entrenched tenets in order to rekindle a culture of innovation and unconventionality that has been dulled by a decade and a half of constant conflict.”<sup>8</sup> In other words, General Votel realized that so much of the force had specialized in the DA mission for so long, and that so many new entrants to the community had only known DA and its FID corollary, that the SOF community’s blinders were starting to result in tunnel

vision. The old adage, if you only have a hammer everything looks like a nail, seems more relevant than ever and is now a pervasive warning across the SOF community. Breaking the habits formed based on the blinders the force has internalized over 15 years is the hard part.

To counteract this tunnel vision and restore the proficiency of SOF across the entire range of core activities, General Votel initiated the SOCOM Design Way (SDW). He further noted, “We [USSOCOM] have evolved, grown, and become increasingly corporate in our processes and products. Our Enterprise requires an approach that facilitates and enhances the untapped creativity, critical reflection, and ability to innovate among our most valuable resource ... our people.”<sup>9</sup> Bureaucracies by their very nature force people to think and act in harmony to achieve economy of scale. Without SOPs, organizations could not deal with vast amounts of data and synthesize the hundreds of interactions their personnel have on a daily basis. But SOPs are a double-edged sword, and right now they are hurting the enterprise more than many would care to admit.

Already the SDW has been applied to challenges faced by the headquarters’ J4, J5, and J6 with significant positive movement accruing against some entrenched SOPs. While design thinking has a longer operational pedigree within the headquarters, the SDW is the experience-based distillation of theory and practice into something practical and staff-friendly. The SDW was developed primarily for operational, strategic, and policy level matters, but it can apply comfortably at the low operational and tactical levels as it nests with operational design. Its utility is becoming more apparent as problems associated with a larger SOF bureaucracy--and transregional, Interagency, and multinational problems such as weapons of mass destruction, terrorism, and their relationship to transregional criminal organizations—consume more SOF attention.

## **Operational Design or Design Thinking: What’s the Difference?**

It is important to discuss what joint and Service specific doctrine say particularly as it relates to design. Whether joint or Service specific interpretations of design, the application of design is to the operational campaign and tactical levels of war. Joint Publication 5-0 describes operational design as being “built upon an iterative process that creates a shared understanding of

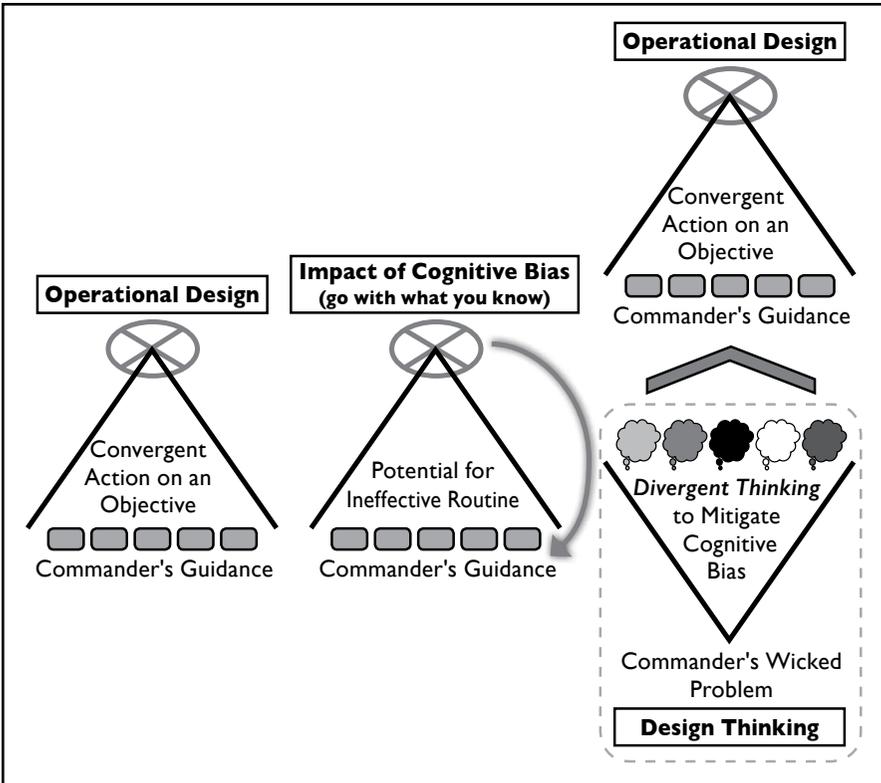


Figure 1. **How the SOCOM Design Way relates to Operational Design.** By itself, operational design emphasizes Commander’s guidance and enables a diverse array of units to converge on an objective (left). The emphasis on the Commander’s knowledge and perspective creates a significant potential for cognitive bias and blinders to (mis) interpret conditions, especially where doctrine appears to answer operational and tactical requirements (middle). Design thinking complements operational design by inviting divergent perspectives to mitigate the impact of blinders with the approach resulting from the inquiry flowing where appropriate into Commander’s guidance for implementation in the operational design process (right).

the OE [operating environment]; identifies and frames problems within that OE; and develops approaches, through the application of operational art, to resolving those problems, consistent with strategic guidance and/or policy ... The purpose of operational design and operational art is to produce an operational approach, allowing the commander to continue the joint planning process (JPP), translating broad strategic and operational concepts into specific missions and tasks and produce an executable plan.”<sup>10</sup> The U.S. Army

describes design as a methodology for applying critical and creative thinking to understanding, visualizing, and describing unfamiliar problems in approaches to solving them with emphasis on operational problems.<sup>11</sup> In each instance, the doctrine seeks to widen the considerations for Commanders and planners when creating the solution to the problem, often in the form of a formal plan or order.

The SDW differs from but complements operational design in three important ways (see fig. 1). First, whereas operational design seeks to orchestrate the actions of dozens to potentially thousands of personnel to converge on an objective, design thinking is about deliberation and consciously seeking out perspectives that diverge to mitigate the impact of blinders and avoid misperceiving how the environment operates. Second, operational design relies heavily upon and defers to Commander's guidance irrespective of his or her staff's conclusions. In the SDW, the Commander attitudinally recognizes that the staff's conclusions and learning form the foundation of Commander's guidance, so there is a joint learning process that precludes the Commander from falling back upon his or her own blinders. The SDW is consequently action oriented and enables the Commander to reach actionable decisions while reducing the risks associated with cognitive bias and organizational SOPs. Finally, while operational design is useful for achieving military objectives within a chain of command, the SDW recognizes that many evolving SOF missions require coordinating activities with the interagency and partner nations (PN) whose own perspectives and blinders must be reconciled with the military's. In such circumstances, shared perspectives of the challenges become crucial because the Commander cannot control the actions of others upon whom he or she must rely for mission success. The others must willingly act in accordance with the Commander's approach because they think it is the right thing to do, but the Commander's approach must take their perspectives and capabilities into consideration in the first place.

## **The SDW**

The authors' core premise is that the SDW provides the foundation for talking about, conceptualizing, deconstructing, analyzing, synthesizing, and acting in a complex adaptive world. It is a way of perceiving complexity and an attitude for operating in it. Above all, the SDW is an ethos of learning

and discovery. The SDW is a way of thinking that enables one to envision what might be possible, what should be created, or performed. In effect, SDW enables one to question the efficacy of a policy, strategy, or mission; an organizational structure; a long-standing process; and, in general, the organizational way of doing things. SDW is a way to navigate the ambiguous, dynamic, and uncertain space that joins politics and the strategic employment of military power.

The SDW borrows from the design schools in the commercial world, but carefully blends the concepts with the operational requirements of the military environment.<sup>12</sup> In SOF<sup>7</sup> line of work, one cannot admire a problem forever. After all, the boss needs deliverables and the deadline is always yesterday. It adopts Nelson and Stolterman's view that "Design is the ability to imagine that-which-does-not-yet-exist, to make it appear in concrete form as a new, purposeful addition to the real world."<sup>13</sup> The SDW is conceptualized as preceding the operational planning process, and it is here that it has greatest value. It is usually applied on the one hand at the strategic level to inform ideas on what operations might be necessary, and on the other hand to inform policy and capability development independent of operational planning.

SDW starts by making a distinction between simple, complicated, and complex problems.<sup>14</sup> Simple problems are easy—the problems are quickly recognized, SOPs serve well, and problems get solved efficiently. Complicated problems are harder. The root causes of problems are not so easily understood and how to redress them takes expertise. This is usually best handled by subject matter experts (SMEs), but the solution is manageable. Technical problems are usually of this nature. Complex problems are altogether a different story than complicated ones. Complex problems have no recognizable cause and effect relationship, SMEs cannot necessarily provide the definitive solution, and the number of people impacted by decisions is unknown due to the nature of the problem. Social problems are typically of this type, sometimes called *wicked problems*, but more on this later.

The SDW is not necessary for simple problems, nor even many complicated ones. It is when problems become persistent and seemingly unsolvable that the SDW is recommended. SDW blends the art of appreciation (empathy) with the science of planning, and it is synthesized into three elements (fig. 2). It is important to remember that the SDW is a constantly iterative

activity—once just is not enough when it comes to complex problems. The three elements are:

1. Appreciate the context
2. Define the problem
3. Develop an approach <sup>15</sup>

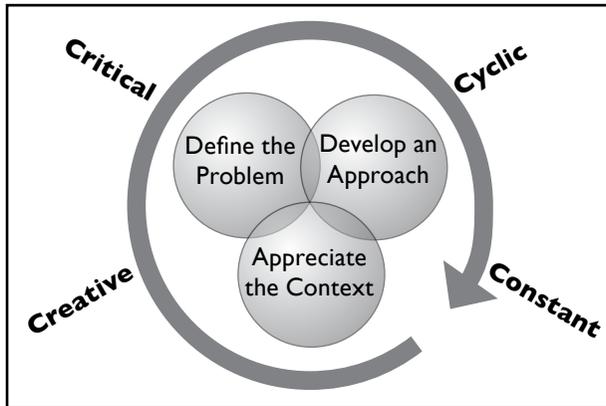


Figure 2. SDW.

While the SDW is not linear in nature, it does have a logical starting point with *Appreciate the Context*. Inevitably, design participants want to begin with *Define the Problem* as soon as new information is learned, but this is why one iteration just is not enough. SDW requires the discipline of continuing the element of appreciation, accruing more information, and reevaluating what was thought to be known; in other words, keep learning! After a few iterations, it is possible and appropriate to *Develop an Approach*, but even this stage is likely to be provisional. In the process of developing an approach, design participants often discover new actors with equities, come to a new appreciation, or try an experiment with negative results.

In the SDW, the most important element is appreciate the context, which is why this monograph addresses SOF blinders. Based on experience, the authors recommend dedicating around 65 percent of the available time on appreciation, another 25 percent on defining the problem, and the final 10 percent on developing an approach. This is a rough estimate, but instructive. Opening one's mind to diverse and divergent appreciations is truly a difficult task. It takes practice and perspective.

The objective of this monograph is to provide a glimpse of the importance of doing so by tackling one of the most fundamentally impactful blinders in the USG—the construct of “the state.”

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*Based on experience, the authors recommend dedicating around 65 percent of the available time on appreciation, another 25 percent on defining the problem, and the final 10 percent on developing an approach.*

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The intention is to show how appreciating the state from a complex adaptive systems perspective brings to the fore a number of problems associated with the government-centric, stability-oriented mindset pervasive across the USG. Wicked problems are intrinsic to the state making authority-based models suitable in certain circumstances, but not others, especially where SOF are often tasked to operate. Chapters 2–6 progressively

explain why the state is paradoxically a conceptual necessity for SOF, but also one of its key blinders.

## What Follows

The SDW thrives when diverse perspectives are invited to and included in the discussion. To borrow a phrase learned at the Rhode Island School of Design, one of the world’s premier art and design universities, the goal is to become “generous listeners,”<sup>16</sup> but this first requires an awareness of personal and organizational blinders. Otherwise, it becomes nearly impossible to hear and interpret what the interagency, partner nations, academics, specialists, businessmen and women, and others from outside the SOF community are trying to convey.

The chapters that follow are laid out in a progressive path for learning about the foundations of complexity and operating within it. While the three elements of the SDW are introduced in this monograph, it is not a primer or checklist on how to use it. Instead, the monograph introduces the base vocabulary and the principles of science necessary for comprehending the complexity dynamics in which SOF now operate. Each chapter consequently concludes with key terms and important summary points. The intent is to introduce some truly important insights from academia and industry without diverging too far from a conversational tone. Based on the authors’ experience, many of the concepts discussed are only occasionally touched upon in professional military education curricula. If successful, the reader

should be able to engage in more fruitful dialogue with others and generate richer appreciations of complex problems through the design way.

Chapter 1 provides the foundation for the SDW and covers three important ideas. First, it explains in more depth the *Appreciate the Context* element. This truly represents the most important component of the SDW and is where the majority of time is spent in any design inquiry. Second, it describes many of the typical sources of blinders impacting people on a daily basis. Third, it lays out the principles and ethics associated with the appreciation element.

Chapter 2 starts to bring to the surface all the things middle school science classes left out and that social scientists are loathe to admit. Chapter 2 provides the foundational concepts for more accurately understanding the source of complexity in the social world. Succinctly put, there are limits to prediction in the social world unlike the world of physics and chemistry. Americans have been brought up on the idea that they are the same, and this is the source of so much angst in the SOF enterprise because the military's planning tools accept the prediction premise and drive activities along a linear, cause and effect path. Correcting this conceptual error will make the gods seem a bit saner.

Whereas chapter 2 covers the basic philosophy of complexity, chapters 3 and 4 offer a brief historical account of how the most impactful blinders have culturally become part of Americans' unconscious assumptions about how the world works. This is where Western science education is put under the microscope and its methods and application placed in proper context. Unsurprisingly, chapters 2 through 4 work together and constitute a critical baseline for framing the rest of the monograph.

Chapters 5 and 6 directly address that singularly powerful blinder, the idea of "the state." It is a valid, tangible, meaningful, and impactful frame. It is an important—indeed, essential—frame through which SOF must view things because the military is an extension of foreign policy. Yet, it is just one frame and its meaning changes depending on the vantage point. To facilitate the learning process, this blinder is separated into distinct components, which makes many contemporary challenges more comprehensible when reassembled. Building upon content in chapter 5, this part of the monograph essentially offers a new appreciation of the context for many readers, which lays the groundwork for applying the insights to the *Define the Problem* element in chapter 7.

Chapter 5 places the concept of the state in historical context. Most states in the world are less than seventy-five years old, yet most people tend to imagine them as permanent, enduring constructs. Chapter 5 provides some background on the notion of the state in order to make sense of how USG blinders cause them to become the center of all things political, military, and developmental. Whereas much military thinking treats states as the object of interest, the spotlight here concentrates on the building blocks comprising them, populations. It is a far messier approach, but entirely necessary for SOF to understand in the era of collapsing or failed governments. This discussion frames the last section of chapter 5 on the myth of stability in countries, especially those with illegitimate governments.

Chapter 6 dissects some common terms that significantly shape how the roles and powers of the state are viewed. In particular, the concept of legitimate government is discussed from both the perspectives of international relations and relational accountability. There is a critical difference between international legal legitimacy and popular legitimacy though military and other USG personnel tend to confuse them to their detriment.

Chapter 6 concludes with an exploration of how the Western notion of the state being an unquestioningly geographic expression obscures modern trends through which “nations of the mind” become meaningful. Briefly, the military spends much of its time trying to figure out how to keep governments—at least the ones favorable to the USG—in control of the populations in their territories, fixed by internationally recognized boundaries, and supported legally based on the concept of sovereignty. Yet, states and nation-states are really just patterns of behavior, not fixed and unchangeable entities. Undoubtedly this is an uncomfortable proposition for many, but the justification for it will become clearer soon. If this idea can be accepted for a moment, then the impact of social media and other modern communication methods on mobilizing people across boundaries can be more readily perceived. This is the culminating point of the monograph for SOF since the UW side of the core activities, particularly special warfare, must incorporate this perspective to be competitive in the emerging international system. Chapter 6 concludes by discussing the impact of the internet on creating nations of the mind—what one might describe as ex-patriots, like ISIS lone wolves—and how they confound traditional conceptions of the state.

Chapters 7 and 8 bring the SDW full circle. Having offered an example of appreciation of the context across chapters 2 through 6, chapter 7 describes

how to define the problem and develop an approach according to the SDW. Chapter 8 concludes the monograph by addressing some common challenges personnel face in the context of a busy, bureaucracy-laden workday. Examples of actual design inquiries are presented throughout the monograph along with the tangible benefits resulting from the efforts. The path ahead should be filled with discovery and “ah-ha” moments and hopefully provide some answers to questions lurking in the recesses of the reader’s subconscious.

### **Key Terms**

Design Thinking, Appreciate the Context, Define the Problem, Develop an Approach, Wicked Problems, Design Inquiry

### **Summary**

- The SDW is an attitude and ethic for navigating through and broadening perspectives on complex challenges.
- The SDW emphasizes divergent thinking to mitigate the impact of cognitive, physiological, and organizational biases, called blinders in this monograph.
- The SDW can complement operational design by informing Commander’s guidance, but serves as an important means of influence when Commanders lack formal authority over vital external partners, such as in interagency or coalition operations.
- The SDW was developed initially for operational, strategic, and policy-level challenges, but applies to bureaucratic and low operational problems as well.
- The SDW has three elements that function iteratively (appreciate the context, define the problem, and develop an approach), but the majority of the effort focuses on the appreciation of the context.



## Chapter 1. Design Thinking: Appreciating the Context

The SDW begins first by gaining and persistently updating an appreciation of the context. The appreciate the context element is the means by which divergent perspectives, interests, and practices are identified, analyzed, and later synthesized into a holistic perception on an issue. Whereas operational design focuses heavily on systematic analysis by determining and analyzing key variables, the SDW instead focuses on systems thinking and the relationships and interactions between actors and systems. Divergent perspectives are so important in the SDW because each person experiences the systemic interactions in different ways, and it is extremely difficult to even know the experiences exist outside a mechanism for giving voice to them.

It is important to note the use of the term “appreciate” instead of “understand.” The choice is much more than semantics because understanding involves a very high degree of cognition which is rarely attainable in a complex world. The reasons for this will be made clearer in chapters 2 and 3, but the short of it is that there are so many moving pieces in a complex environment that no one can truly understand all of them; their symbolic, political, or spiritual meanings to all participants; or the interests and challenges imposed upon participants due to changes in the system. While one might strive for understanding, in most cases the best one can approximate is likely just empathy.<sup>17</sup> Appreciate the context is, consequently, more akin to looking at a piece of art where one seeks to interpret and give meaning based on his or her own perspective and perceived context. Appreciation is a very subjective, interpretive approach to learning and gaining the necessary insights to inform action.

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### Blinders Are Natural, Roll with It

For decades researchers in the fields of biology and cognitive psychology have explored the various ways the human mind has evolved to consume,

categorize, process, select, and retain the thousands of data points to which the body is exposed on a daily basis. The general conclusion is that human biology plays tricks on the mind, but it is the only way people can make it through their busy days. Daniel Ariely notes:

Our visual and decision environments are filtered to us courtesy of our eyes, our ears, our senses of smell and touch, and the master of it all, our brain. By the time we comprehend and digest information, it is not necessarily a true reflection of reality. Instead, it is our representation of reality, and this is the input we base our decisions on. In essence we are limited to the tools nature has given us, and the natural way in which we make decisions is limited by the quality and the accuracy of these tools.<sup>18</sup>

In recent years there has been quite extensive authorship on how the body filters information, including both the positive and negative aspects associated with it.<sup>19</sup> The range of potential blinders include biological sensing, cognitive biases, personality attributes, and role requirements. As one might guess, some of the blinders are physiological in nature, and they are not going to change. Roll with it. Others are social in nature, and they are not going to change. Roll with it. In the end, all people are creatures of habit, and the best they can do is compensate for what they know are universal personal weaknesses.

The appreciate the context element of the SDW works precisely because it is a compensation mechanism that acknowledges people cannot change who or what they are. Every person is encumbered by cognitive and biological blinders—or said another way, every person has filters created, reinforced, and shaped by values instilled throughout his or her life through socialization, education, personal experiences, and the interpretation of those experiences. These are typically unshakeable and lead to the inclusion of information that reinforces the accepted explanations of a thing or idea or the exclusion of information that diverges from it.

## **Personal Constraints on Perspective**

The old saying that “truth is where you stand” cannot be overstated when confronting complex phenomena. Without devoting too much space to the

enormous range of blinders to which each person is subject, the following constitutes a decent overview of just the biological influences on framing:

1. Remembering is different from experiencing since each person's biological responses affect framing<sup>20</sup>
2. Visual (mis)perception<sup>21</sup> and illusion<sup>22</sup> shape and color experience and memory
3. Physical reactions to stress reduce mental acuity, meaning the brain has trouble processing information<sup>23</sup>
4. Physical stress limits complex cognitive functions<sup>24</sup>
5. Ego depletion weakens motivation, meaning "After exerting self-control in one task, you do not feel like making an effort in another, although you could do it if you really had to"<sup>25</sup>
6. Personalities with a penchant for impatience or impulsiveness rely on intuition and inherently subjective memory<sup>26</sup>
7. Confirmation bias results from the satisfaction and emotion associated with feeling knowledgeable about or familiar with something<sup>27</sup>

Even decision making itself is, in an odd way, a key filter. Ariely's work in the field of behavioral economics challenges the commonly accepted assumption that the average human acts rationally. Many readers are probably thinking, of course each person makes rational decisions according to his or her own self-interest. Or do they? Ariely's research supports the uncomfortable idea that everyone acts "predictably irrational." He writes that expectations, and many other invisible variables comprising the complexity of a particular context, subconsciously influence reasoning. For example, rationality is found to be heavily shaped by conversation, the use of particular terms to subconsciously convey infused meanings, the recency of a framing conversation, and the context in which a decision is placed given these factors.<sup>28</sup> People also tend to engage in anchoring, which means their initial perception of the context is first impacted by the most relevant, seemingly similar reference point in memory. Even if the reference point is a flawed one, it sets the contextual framing all the way down the line.<sup>29</sup>

The SDW accepts the extensive research indicating that decision making is inherently biased and that people often misinterpret or ignore evidence

all together. Nevertheless, studies show that decision errors can be reduced when contextual factors are included in the process.<sup>30</sup> From a design perspective, the objective is to place events, ideas, or patterns in broader—even multiple and varied—context to gain a holistic appreciation of the issue before passing judgment and coming to action-oriented decisions. To accomplish this trick, however, it is necessary to briefly explore how people think.

After more than 25 years of research on fast and slow thinking, Dan Kahneman offered what is commonly accepted as system 1 and system 2 thinking. System 1 is what the brain relies upon most of the time. It is automatic, runs on intuition, and feels easy to use with seemingly no effort. People depend upon past experience and familiarity to get fast answers. To appreciate its value, imagine how hard the average day would be in terms of driving, using a computer, or interacting with others without this system in place. System 1 is far more influential than people think and informs most choices and judgments they make.<sup>31</sup>

System 2 thinking, on the other hand, comes in handy when “the spontaneous search for an intuitive solution sometimes fails ... In such cases we often find ourselves switching to a slower, more deliberate and effortful form of thinking.”<sup>32</sup> System 2 thinking takes time, can be slow, exhausting, and seemingly painful. It requires challenging initial perceptions and core assumptions and can be disruptive to both personally held beliefs and organizational truths. In short, there is not much incentive to engage in system 2 thinking until most system 1 solutions fail. In practical terms, the culture of the military is not overly conducive to system 2 thinking. Everyone’s day is full with email, administrivia, meetings, and actual work. Slowing down to deliberately think about problems is difficult both from the time-in-the-day angle and the mundane expectation of what work looks like. Honestly speaking, how many people would be encouraged by their superiors to sit at their desk or in a conference room just reading about and discussing complex problems?

The implication is that military culture broadly, and SOF culture in particular, is underpinned by system 1 thinking. For most things, system 1 thinking often gets validated quickly by system 2, and moves on to the next issue. Occasionally, system 2 thinking identifies a problem and overrides system 1, but it is hard to overcome habit and sometimes system 2 misses cues to take over.<sup>33</sup> This often occurs when a person anchors on his or her past. For example, one might quickly assess an operational situation and

draw comparisons to many previous experiences. From there one might draw conclusions and make judgments inappropriate for the new context.

Given that people rely heavily on system 1 thinking, they depend upon intuition and heuristics to offer quick insight. A heuristic is a simple mental shortcut that helps humans find sufficient answers—albeit fallible—to perceived problems or questions.<sup>34</sup> Associative memory is the core of system 1 thinking, but it has inherent flaws. When seeking to gain an appreciation of complexity, it is important to recognize and guard against the system 1 associative tendency that leads to over-simplification:

When confronted with a problem—choosing a chess move or deciding whether to invest in a stock—the machinery of intuitive thought does the best it can. If the individual has relevant expertise, she will recognize the situation, and the intuitive solution that comes to her mind is likely to be correct ... When the question is difficult and a skilled solution is not available, intuition still has a shot: an answer may come to mind quickly—but it is not an answer to the original question ... This is the essence of intuitive heuristics: when faced with a difficult question, we often answer an easier one instead, usually without noticing the substitution.<sup>35</sup>

In his best-seller *Blink*, Malcolm Gladwell writes about what is called the “adaptive unconscious.”<sup>36</sup> He writes, “Our unconscious is a powerful force. But it’s fallible. It’s not the case that our internal computer always shines through, instantly decoding the ‘truth’ of a situation. It can be thrown off, distracted, and disabled.”<sup>37</sup>

To place these insights in a SOF context, imagine a team is on its third rotation with a mission to train, advise, and assist a partner force. It is the team’s tenth deployment conducting similar missions. The adaptive unconscious and system 1 thinking guides the team to only see the similarities of the current situation to the past, strengthening the belief that it perhaps understands its operating context and that past successes will carry forward. Yet, this deployment, like each before, is unique and novel. Even if the team is partnered with the same force, operates on the same terrain, and confronts generally the same adversary, the complex system has evolved in many overt and perhaps even more imperceptible ways. This is a perpetually repeated example wherein past success and deep experience can in fact contribute to the creation of an organizational and individual blinder. When the mission

becomes about the activity instead of the effect—the “got this” feeling—then it is time to pause and reflect.

The good news is that it is possible that “our snap judgements and first impressions can be educated and controlled.”<sup>38</sup> System 2 is the more deliberate system and is associated with choice, especially the choice to think deeply and deliberately.<sup>39</sup> The fact is that everyone depends upon both system 1 and system 2 in their daily decision making, but engaging in system 2 often requires conscious effort and planning. Unsurprisingly, the appreciate the context element of the SDW has its roots in system 2 thinking because it forces participants to slow down, examine assumptions, and take the time to learn about systemic interactions they would otherwise not imagine. Often-times the problems people perceive are not the real issues driving events, but system 1 snap judgments fool them into thinking they know what is going on.

System 2 reflective thinking about past experience can help draw more accurate, or at least divergent, conclusions from hindsight and prompt more useful research and discovery efforts. The deliberate act of choosing to engage in system 2 thinking forces new frames on memories to promote results more accurate than would otherwise be the case with just ‘intuitive’ system 1 thinking. Kahneman cautions against “our excessive confidence in what we believe we know, and our apparent inability to acknowledge the full extent of our ignorance and the uncertainty of the world we live in. We are prone to overestimate how much we understand about the world and to underestimate the role of chance in events. Overconfidence is fed by the illusory certainty of hindsight.”<sup>40</sup> He credits Nassim Taleb, the author of *The Black Swan* for influencing his thoughts.<sup>41</sup>

## Organizational Constraints on Perspective

Beyond these personal blinders, everyone is also subject to blinders imposed by institutional dynamics. The purpose of an organization is to harness the abilities of a group of people to achieve a goal even when the individuals in the group have different motivations. During the 20th century, bureaucracy was perfected to achieve a high level of efficiency through rational systems, repetitive tasks, and specialization through roles, rules, and standard operating procedures.<sup>42</sup> Organizations attempt as much as possible to cause people to see things in basically the same way since the more successful the organization is in creating a common culture, the more likely its rules,

routines, and hierarchies will be accepted due to adherence to “collective meanings.”<sup>43</sup> Unfortunately, these same norms of behavior and collective meaning might hinder the ability to see the forest because one can only see a single tree. Think again about the adage of a hammer looking for a nail. If organizational culture is rooted in a particular line of thinking it often limits consideration of alternative perspectives, especially those contrary to the established collective meanings.

Consider how SOF core activities are often associated with specific SOF organizations. Observable biases often manifest when confronting an operational problem. For example, a special forces officer is likely to adopt UW as a filter through which he sees and interprets problems. On the other hand, an operator from the Navy would likely have a DA filter since UW is not part of the Navy’s traditional mission set. These mission frames are useful for the relevant individuals and units. However, these organizational filters foster convergent solutions to complex problems among members who might deny or prevent the emergence of novel approaches more suited to the context.

Gary Klein argues that organizations can and often do obstruct, suppress, or ignore insights hidden below the surface.<sup>44</sup> All organizations, to include SOF, fall prey to what he refers to as the predictability trap, wherein the expectations of a predicted outcome limit the consideration of other options, ideas, or actions that might otherwise “detract from success” in achieving that prediction. If one believes counterinsurgency (COIN) is the path to victory when the CT centric approach predominates the organization, then evidence contravening the CT approach is often unconsciously ignored or undervalued if received at all. The challenge as expressed by Klein is that “insight” is the opposite of “predictability.”<sup>45</sup> Insights can be disruptive, divert attention, and lead to a different, unexpected, and more emergent path. These perceived uncertainties can be viewed as organizational risk to be avoided. The biological response is often to fall back on system 1 thinking—back to intuition, past experience, and organizational mantras—to offer comfort that the decided path is the right one.

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*Insights can be disruptive, divert attention, and lead to a different, unexpected, and more emergent path.*

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This process is called path dependence, and it is something that appears throughout the monograph. In sum, creating institutions and organizations is cumbersome and painful. The initial starting conditions have to be just

right internally and in the environment for the organization to survive. Once an organization makes it, the goal is to scale up and replicate for expanded efficiency, so it needs everyone to tow the company line. Herein lies the dilemma of path dependency—the environment always changes, so the initial internal conditions that enabled the organization to survive might become unsuitable to the new external environment, but change is extraordinarily difficult both structurally and culturally.

Social pressure to conform or show distinction is real in human institutions and organizations<sup>46</sup> and this helps to reinforce path dependency and organizational myths. It also makes innovation and creativity disruptive to the bureaucracy and potentially subversive from some leadership perspectives. The SDW was initiated by General Votel precisely because he believed the SOF enterprise's system 1 thinking was taking too much of the oxygen from system 2. To correct the imbalance, he recognized the need to encourage system 2 as a way of doing business; that is, to initiate a change in organizational culture which continues today under USSOCOM Commander General Raymond A. Thomas. If one were to reflect on his or her own SOF organization, he or she might find current examples of how the way of doing things shapes expectations, drives specific behaviors, and discourages or suppresses divergent thinking. The SDW is needed now precisely because the SOF enterprise used to be divergent thinking.

## **Perspective is Everything**

If appreciation is underpinned by context and subjectivity, it is crucial to first become self-aware of personal biases. Much like a pair of eyeglasses, everyone views the world through lenses and filters be they cognitive, organizational, structural, or procedural. Lenses serve to bring into focus things which are fuzzy, unclear, or blurry while filters limit the passage of information to the brain. Sunglasses are filters, purposefully designed to block UV and other light to protect the eyes. In the real world everyone has filters that prevent the passage of information to the brain despite the fact the information might be useful to inform a judgment. Oftentimes these filters are cognitive biases or prejudices layered like the bricks of a house over time.

For instance, consider the two images in figure 3. Both are of the city of Guernica in the aftermath of the Spanish Civil War. The picture of the bombed building is equally truthful as Picasso's famous 1937 painting

*Guernica*, but the framing each presents results in a different interpretation of the same event. The photograph of Guernica typically taps into the more cognitive side of the brain. The observer is instantly transported back in time to the WWII-ish era, intuits high explosives, likely some kind of trajectory by which explosives were delivered, probably some form of metal work in the manufacturing of the explosives, etc. Death and destruction clearly occurred, but the way the experience is framed is probably of a technical nature. Now explore Picasso's *Guernica*. It contains people and animals, chaos, suffering, distortion, death, grief, etc. The framing accesses an entirely different part of the brain. In fact, without the title, *Guernica*, the painting could be the tragedy of war anywhere at any time. Like Guernica, the real world is comprised of convergent and divergent perspectives, sometimes paradoxical, each dependent upon where one stands, the time, and the context.

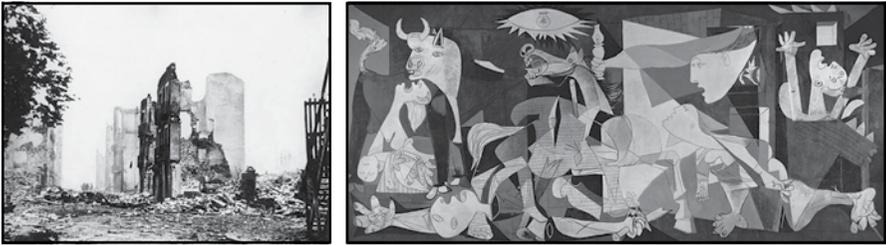


Figure 3. Two images of Guernica, Spain, in the aftermath of the Spanish Civil War. PHOTO (LEFT) BY BUNDESARCHIV, BILD 183-H25224/WIKIMEDIACOMMONS/CC-BY-SA 3.0. PHOTO BY JOSEPH MARTIN/NEWSCOM OF ART BY PABLO PICASSO IN THE REINA SOFÍA NATIONAL ART CENTER MUSEUM

Appreciating the context is not a one-time endeavor; rather, to maintain the appreciation it must be a continuous and iterative activity to make sense of the world—albeit a subjective interpretation. The next few chapters demonstrate that the world is an ever-changing system of innumerable actors, relationships, and factors each interdependently woven into a complex web that cannot be mapped nor fully deconstructed. No matter how much time and energy is applied, it is impossible to not be overwhelmed by the inestimable number of visible events, indicators, and nodes that are in fact signals and signs of more hidden complex systems. The military so often attempts to map and feed superficial-level data into some magical algorithm in the hope of mirroring the real world. Such an approach might have utility at the tactical level, yet is difficult to scale beyond narrowly focused mission sets.

When framing is discussed in design, the term is often used to mean two different things. First, it is the conscious and purposeful act of bounding one's thinking, the system, or the issue at hand. The frame could be analogous to the window through which one views and interprets the world. The larger the frame, the broader the perspective one can have to learn, judge relationships between aspects of the system, and place actors, nodes or items within a broader context. The second meaning for framing refers to a deliberate rubric one might use to organize his or her thoughts about a particular topic in order to facilitate investigation and learning. This type of frame is also called a lens or, perhaps, a framework. Diplomatic, Information, Military, Economic, Financial, Intelligence, Law Enforcement (DIMEFIL) is an example of such a framework, but it only captures a very small portion of what the military needs to learn. Systems thinking is a powerful tool that can be used effectively to frame and learn about an issue and constitutes the main substance of the chapters that follow.

Each frame can be comprised of many different lenses, filters, or both. Much like eyeglasses, a lens serves to bring clarity, focus, and, in some instances, magnification. The fog of uncertainty can often be reduced by a lens that brings a specific aspect of the system into focus. Each frame may also have one or more filters. Filters serve to limit the passage of certain information or data. The filtering of information changes the interpretation. Unlike sun glasses that limit UV rays and visible light, personal filters are often cognitive or biological blinders about which one is typically unaware. As discussed above, cognitive filters might be comprised of bias, prejudice and belief systems that deny, diminish the importance of, or modify information in ways that skews the interpretation of the system. One cannot remove cognitive filters, but can be self-aware of them and purposefully seek to reduce their impact on the learning endeavor by including the perspectives of others in a spirit of empathy.<sup>47</sup>

Another useful technique is to change the scale to alter how the relationships in the system are perceived. For instance, one can learn different things by first viewing a small scale of a single panel on the ceiling of the Sistine Chapel, and then the entire ceiling with all the panels in view. Both scales offer the same information, but with different context. Changing scale means looking at the broader system (zoom out) to see relationships between entities, or drilling down on something to see the finite details—perhaps the moss on one tree in a large forest.<sup>48</sup> It might be that the moss is not

important, but this cannot be known until the investigation concludes after which the search continues elsewhere.

Since everyone's frames are limiting, it is essential to frame and reframe the system from different scopes and scales to promote learning. It means making a conscious effort to change perspectives by inviting in outside participants or those with significantly different backgrounds and interests. As SOF missions increasingly integrate interagency and PN capabilities, design thinking will become a base skill for many missions and inevitably enhance operational design efforts. The intent of appreciation is to purposefully use as many frames as possible to view and interpret the world—to learn despite knowing conclusions are incomplete and temporally bound in complexity.

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*As SOF missions increasingly integrate interagency and PN capabilities, design thinking will become a base skill for many missions and inevitably enhance operational design efforts.*

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### **It's an Attitude and an Ethic**

The point of the discussion on appreciate the context is not if one has blinders, but whether one is self-aware enough to adopt behaviors that can help overcome them in order to accept and leverage new data to gain new insight and learning. In other words, appreciate the context is an attitude and ethic. This is a fundamental change to the way people are generally taught to interact with others and interpret the world.

Given the nature of complexity, addressed in much greater detail in chapters 2 to 4, the SDW is careful to recognize the limits to perfect insight and knowledge. American military culture is often drawn to the notion that, with enough resources and data, uncertainty can be removed from the battlefield—in complete contradiction to the body of military theory. Whether one turns to Western or Eastern philosophies, the certainty of uncertainty-in-war remains at the forefront. The SDW asserts that understanding by common definition is fleeting and can only be attained in the most narrowly focused circumstance.

Appreciation is, therefore, a forever activity—it is about learning. The attitude is that one is aware he or she only sees the tip of an iceberg, but knows much more lies beneath the surface (see fig. 4). Appreciation as an ethic is forever seeking to explore the problem or issue in new directions, to include new

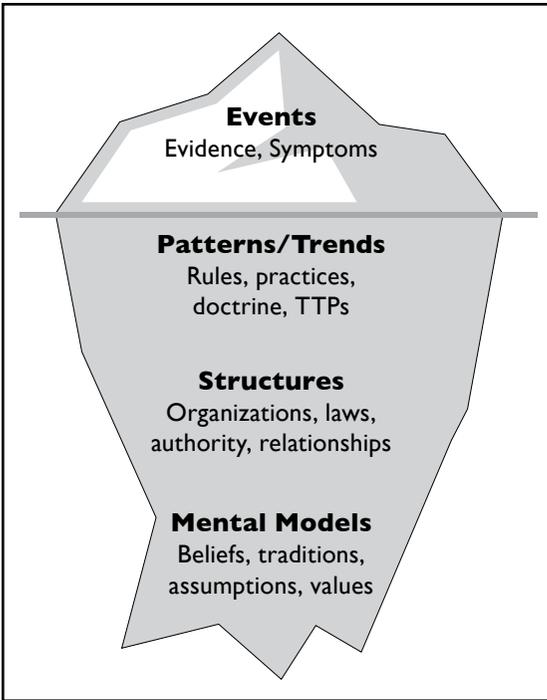


Figure 4. The Iceberg Model of analysis.

and oftentimes different or paradoxical perspectives with the purpose of gaining new insights to inform judgment and actions in complexity. It is also an acknowledgment that judgments are based on subjective, and therefore temporary, interpretations and will change as learning continues through further appreciation. Uncertainty and the dynamic nature of the real world are accepted as foundational perspectives, and one must always seek to synthesize new perspectives to create a more holistic view.

The Rhode Island Office of Veterans Affairs Vignette (fig. 5) demonstrates the importance of appreciation from multiple angles. What originally looked like a funding problem to the personnel in the Office of Veterans Affairs transformed through a design inquiry into a different, more manageable problem altogether. The fresh perspective injected by the Rhode Island National Guard enabled the personnel to reimagine the issue and change their mental models for a fresh approach (revisited in chapter 7).

## Where to Begin

Remember that appreciating the context refers to learning about the current state of the system, called the current context. Before even considering the future, one needs to explore the current world. There are many tools available from red teaming, planning, or critical thinking to begin appreciating. Perhaps the best way to start is with self-reflection to lay out assumptions and ward off constrained thinking. There is no right or wrong starting point

for this endeavor. For example, employ a familiar heuristic to begin exploring what is thought to be known about the complex phenomena at issue. The critical aspect of beginning the appreciation element is to be open to an unconstrained or unstructured exploration of ideas, perspectives, and interpretations. Avoid convergent thought or gaining consensus, as this will ultimately limit learning. The reality is the world is messy, which is why appreciating the context requires generous listening.

### **Key Terms**

Systematic Analysis, Systems Thinking, Empathy, System 1 Thinking, System 2 Thinking, Heuristic, Associative Memory, Path Dependence, Framing, Current Context

### **Summary**

- Cognitive, biological, physiological, and organizational blinders are a natural, inevitable part of life, and the SDW compensates for this reality by seeking out and adopting an ethic of empathy for divergent perspectives.
- System 1 thinking constitutes the primary source of fast, intuitive thinking that makes it possible to work efficiently, but it is prone to blinders unless occasional efforts at slower, deliberate, system 2 thinking are untaken.
- People cannot eliminate blinders and frames, only be aware they have them and constantly challenge the assumptions they promote.
- Appreciating the context is an attitude of constant learning, but it is always self-consciously understood to be a subjective interpretation of reality.

### **Vignette. The Rhode Island Office of Veterans Affairs: Appreciation of the Context**

In 2016, the Rhode Island National Guard was asked by the governor to assist the Rhode Island Office of Veterans Affairs (RIVETS) with a complex service delivery problem due to its familiarity with the SDW and access to the veteran community. An important aspect of the SDW is conveying learning and meaning through visualizations and metaphor, typically in the form of drawings or graphics because visuals convey powerful meanings and

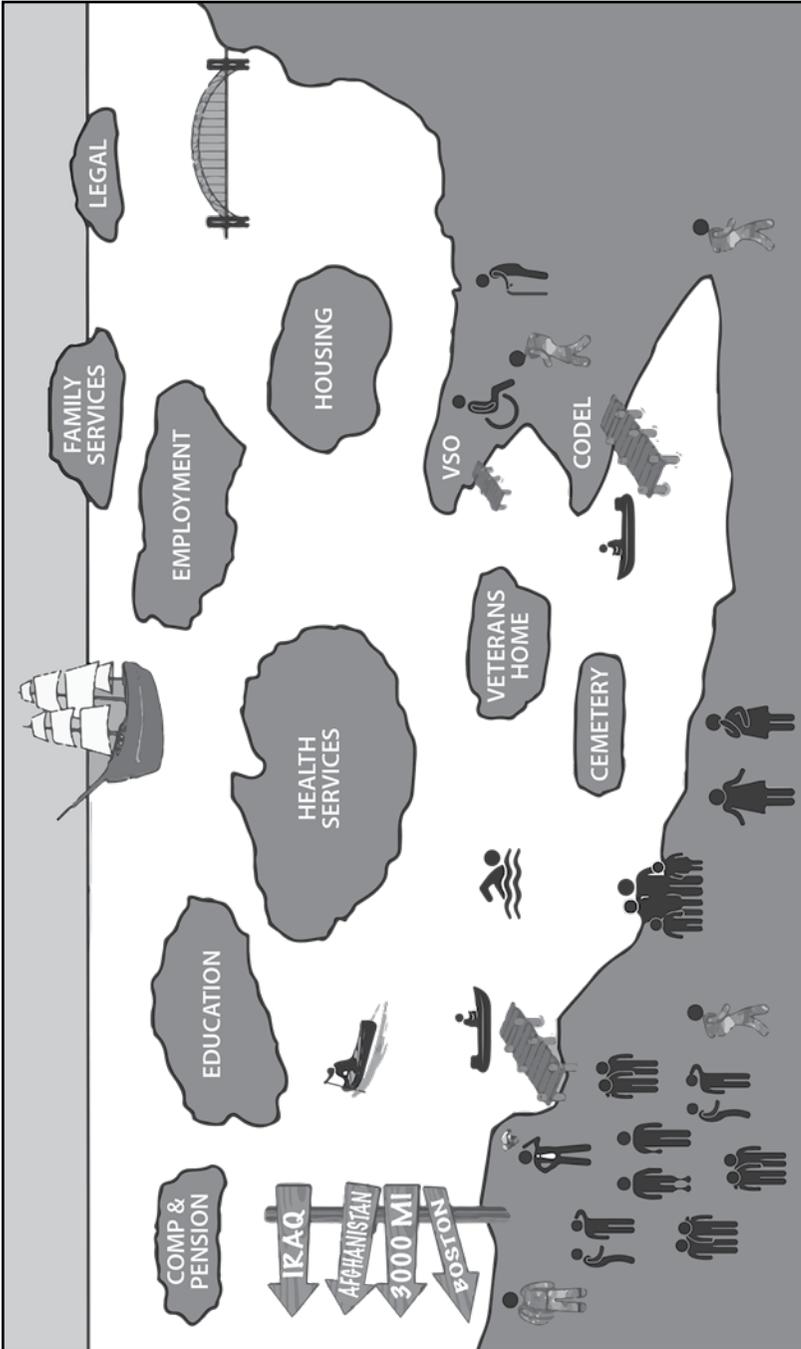


Figure 5. Rhode Island Veterans Administration Design Inquiry Visualization of the Current Context.

emotions as seen with the Guernica example. The RIVETS Design Inquiry team generated the visualization and narrative (fig. 5) to convey its appreciation of the context.

**Appreciation of the Context.** “There is strong public support for Rhode Island’s Veterans and their families. This ‘sea of goodwill’ has led to numerous programs and services for those who have served and those who support them at home. However, there is no clear access point for Veterans and military families to engage this support and the services that have sprung from it. Without a collaborative, coordinated effort to address this challenge, too many Veterans who have shouldered the burden of our nation’s wars will continue to miss out on opportunities to improve their health and their economic well-being ... While there exists a ‘sea of goodwill’ in Rhode Island to assist Veterans, the waters are choppy and difficult to navigate. While there are few, if any, gaps in the services provided, the gaps that may exist are among the providers of services. In other words, robust, quality services are available but the delivery model is unconnected, uncoordinated, underfunded, and understaffed.”<sup>49</sup>

**Comments.** Note the islands of services in the sea of goodwill. There are no mechanisms to connect the service members, veterans, and their families to the service islands, and there is even a bridge to nowhere indicating how hard it is to use the available infrastructure. Some seize the initiative and swim to the islands while others independently navigate the sea in boats. Yet, the majority wander around trying to figure out how to access the available services without clear direction or a port of entry. This appreciation of the context depicts a significant degree of learning regarding the system of public and private veterans’ services in Rhode Island, and transformed the RIVETS appreciation from a matter of increasing funding to the bureaucracy to one of coordination and marketing among providers. The outcome of this design inquiry is presented later in chapter 7.



## Chapter 2. Complexity and Wicked Problems

It's a complex world out there. Yes it is, but how does knowing this help? The answer is that it helps determine when to pull SOPs and doctrine out of the kit bag and when not to. Some things really are not complex at all, and there are great training and tools to address problems of this sort. Other things are far more complicated, and the training and tools just are not sufficient for getting the job done. The terms 'complicated' and 'complex' are often used interchangeably, but this muddies the waters on some very important points.

The introduction presents the idea that there is a difference between simple, complicated, and complex problems. This is not new or novel. Management science has been playing with these concepts for decades, and these distinctions are here borrowed from a particular model called the Cynefin Framework (fig. 6).<sup>50</sup>

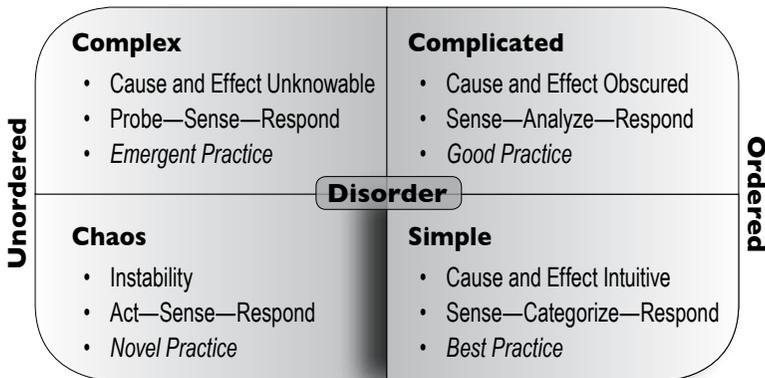


Figure 6. The Cynefin Framework.

The first thing to know is that the Cynefin Framework is a sense-making model. This is different than the models typically used during the work-day called categorization models. Categorization models are very useful for figuring out which SOP to follow. Data comes in, the category with which it corresponds is determined, the SOP book is pulled off the shelf, and the correct procedure is executed. Simple day. With categorization models, the

model preexists the data. Data is jammed to fit the model regardless of how good a fit the model really is. As a result, this is where framing error comes into play and effectiveness in bureaucracy starts to erode.<sup>51</sup>

Sense-making models, on the other hand, are about determining what the data mean in the first place. In some cases, the first issue might be to explore whether the available categorization models are the right tools for the job. For this task sense-making tools are useful for figuring out the nature of the operating environment and for determining the appropriate types of activity given the situation. Moreover, because people have different views of the world, it is often the case that diverse groups view the same situation with different perspectives. The Cynefin Framework is a tool to determine the nature of the operating context and assist in reconciling the tensions inherent in group settings when people view the context of the environment in distinctive ways.<sup>52</sup> So, why is there a disorder category in the Cynefin Framework? The disorder category represents the diversity of perspectives in a group; most people get confused about the domain in which they are operating, and the trick is to reconcile differences in sense-making so they are all operating in the same domain.<sup>53</sup> However, to know the operating context, it is essential to know whether or not cause and effect can be predicted.

Much is written about cause and effect in chapters 2 and 3, and that is mainly because it is a key principle underlying the concept of complexity. The reason humans can send people to the moon, split atoms, or stream live video to cell phones is due to the scientific method rooted in determining how certain variables impact an outcome. The hard sciences, like physics, chemistry, and engineering are all rooted in laws of nature that pretty much hold all around the planet. People are really, really good at manipulating the world around them when they can determine cause and effect.

Here's a quick, simple review of the scientific method on which Americans—most people in the Western world, really—have all been raised. With a scientific formula of  $A + B = C$ ,<sup>54</sup> an experiment can measure the impact of a change in variable A or variable B on outcome C. So, to measure and predict the impact of changing variable A on the outcome of C, variable B must have no changes at all—variable B must be held “constant” with no variation (nadda, zilch, completely the same). Any tweak to variable A that impacts outcome C can then be measured, statistically analyzed, made into a nice mathematical formula, and used for future prediction. Variable A

can then be held constant, variable B can be experimented with, and new predictions for how changes to variable B impact outcome C can be derived.

Most modern technology is dependent on this type of cause and effect analysis, but there are limits to the process. First, the cause and effect model assumes it is possible to know all the variables impacting outcome C. Second, it assumes the variables can be controlled to a “nadda, zilch, completely the same” experiment to determine how a change in a variable causes an effect on the outcome of C. Third, it assumes the experiments can be completely reset, started from the exact same conditions with the exact same proportions of the variables, and tested over dozens, if not hundreds, of times.

When any of these three conditions fail, the whole cause and effect construct breaks down and things start to look complicated or, even worse, complex. The Cynefin Framework offers an idea of how to respond based on the sense-making of where cause and effect sit relative to the context. On the right side of the model, the system is described as ordered. Cause and effect are identifiable even if sometimes obscured. In the simple domain, cause and effect are readily known, categorization models are perfect for responding, and SOPs make all the sense in the world. In the complicated domain, cause and effect cannot be easily determined, so SMEs are often needed to help figure out the dynamics. Fortunately, SMEs can determine what is happening in the system and can chart a path based on their expertise. Here, SOPs and doctrine become problematic and less able to handle the nuance of the context.<sup>55</sup>

On the left side of the Cynefin Framework, the system is described as unordered. Cause and effect cannot be determined and it is not even clear what variables to include in the data. In the complex domain, not even SMEs have enough knowledge of the system to fully inform approaches to problems. There are just too many things going on above and below the surface and no variables can be held constant. In such an environment, the only way to judge what to do is to experiment, figure out what works well and amplify the activities, or figure out what fails and immediately shut it down once failure begins to happen. In the chaos domain, there is no logic or order to what is happening, and the only way to deal with the system is to impose order, sense the response, and adapt or experiment broadly to find better solutions.<sup>56</sup>

Sometimes it is possible to move a system from one domain to the next, but it first requires accurately identifying the correct starting position.<sup>57</sup> For

example, a series of positive, amplified activities in the complex domain can move a system over time to a complicated one. On the other hand, there is a danger lurking between the “simple” and “chaos” domains. For instance, the bureaucracy can come to see everything it deals with as a matter of categorization and jam everything into a matrixed SOP response.<sup>58</sup> The more that happens, however, the more likely it is to get blindsided by changes in the environment. When that happens it can fall off the cliff of the “simple” domain into the chaos domain as it tries to figure out what just happened and why.<sup>59</sup> Recovery is possible, but very expensive in terms of resources and labor.

So, why is the Cynefin Framework valuable? Precisely to frame when the SDW can help the most with different types of problems and provide warning about the consequences of allowing blinders from the simple domain to cause a fall off the cliff into chaos. The SDW is best suited for challenges in the complex and complicated domains, but in a pinch also helps attitudinally with how to act and think in the midst of chaos. Virtually all social interactions fit into these categories for reasons explained shortly. But, bureaucracy tends to jam as much as possible into the simple domain so that SOPs can produce economy of scale efficiencies. As discussed before, though, when every challenge is a nail, the hammer is the simple solution to all things and over the cliff we fall.

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*The SDW is best suited for challenges in the complex and complicated domains, but in a pinch also helps attitudinally with how to act and think in the midst of chaos.*

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## The Foundations of Wicked Problems

So, what is in the nature of complexity that makes cause and effect so difficult to discern? In reality, it is all about perception and the assumptions made regarding the predictability of human interactions. The backdrop of complexity goes back to middle school science class and the presumption of science and society being based on the orderly and progressive accumulation of knowledge. The scientific method is basically about systematic analysis and reducing an object to its component parts. In the previous simple model, outcome C can be reduced to variables A and B. Because we can control variables A and B, we can predict changes in outcome C based on

the mathematical models of how variables A and B impact C. In the social sciences, social scientists added in the idea of humans as “rational actors” in the 1950s in order to try to make them act like normal variables; it is hard to create mathematical models of human behavior when they act “irrationally,” or, in other words, against the assumptions of the models.<sup>60</sup> The idea held that, “I might not understand all the cultures in the world, but I know what people ‘rationally’ want in life.” It is far easier to run an organization or play politics with a rational actor model, but when the variables fail to act like the model, it is not possible to “reduce” them after all. Reductionism and rationalism have been two of the most powerful underlying concepts in the Western cultural mindset for generations.<sup>61</sup> They are intrinsic to how many see the world that they are often simply taken to be the way the world works.<sup>62</sup>

Complexity as an experience, then, is more about the frustration people feel when reality fails to abide by how they expect the world to work. This aspect of the issue will be addressed at the beginning of chapter 3. Suffice it to say, there is a robust recognition across the physical and social sciences nowadays that the expectation of a reducible, predictable, and stable world only applies to a slice of life, not all of it. While it worked well to launch the scientific revolution of the nineteenth and twentieth centuries, it has limits.<sup>63</sup>

Complexity theory, especially those scholars working in the area of Complex Adaptive Systems, actually take the opposite perspective—that much of life is, yes, rooted in seemingly predictable patterns, but that these patterns rest upon a foundation of ever-changing building blocks. As the building blocks change, so do the foundation and the resulting patterns over time.<sup>64</sup> There are two key issues for complexity theorists. First is the fact that most everything operates in a series of systems with each system composed of innumerable variables about which very little is known. Oftentimes these systems overlap and interact in unseen, but meaningful, ways. Under these circumstances, it is very difficult to determine when, how, or under which conditions the system interactions will occur and to what end. Second is the fact that the building blocks in each system change over time due to both external challenges and internal adaptation.<sup>65</sup> Sometimes the environment changes, such as with the introduction of new technology like the internet and smartphones, but environmental changes can cause the underlying variables, in this case people, to change how they behave, which in turn changes the way the system operates.

Complexity from this perspective occurs because the cause and effect model that underpins science breaks down. Even within a single system, the variables cannot be held constant to determine their impact on the outcome. Moreover, an experiment can never be reset to the exact same conditions because life moves on—there are no do-overs in the real world. At best it is possible to approximate the original conditions to derive a sense of existing patterns and trends, some of which are more enduring than others thereby giving the sense or feel of a stable reality. Adding in the notion of systems interacting, or perhaps colliding, the challenges associated with predicting the future grow by magnitudes over time.

The internet and smartphone example is again instructive. Society's building blocks, say children born in the early 1990s, adapted to the reality of a system of communication not tied to a corded phone or computer. Their behavior morphed over time to adapt to the new opportunity. However, the children born in the 2000s grew up in a society dominated by wireless, instant communication where the expectations and behaviors were already in place and passed down at a very early age. The building blocks of society changed naturally and by virtue of internal adaptation. People could choose to swear off wireless technology and prompt yet another internal change, but they likely will not.

In terms of Complex Adaptive Systems, the taxi industry could not have imagined in 2000, when cell phones were really taking off, that Uber would emerge in the system to challenge its market. Yet, this is precisely the situation. Uber's rise is actually based on a series of systems coming together in unpredictable ways. It required a system of cellular technology to mature, systems of political regulation to change, the system of computer companies to compete for handheld computers, the system of geospatial information service providers to integrate with cellular and computer companies, and the system of consumers to find private drivers more desirable than taxis. In 2000, most taxi companies probably assumed the public transportation system would remain static and that cell phones would provide another convenient form of communication with dispersed drivers. In Cynefin Framework terms, the taxi industry operated in the simple domain. Now it is a whole lot more complicated.

So, what are the characteristics of Complex Adaptive Systems? In general, they have six basic properties. They:

1. cannot be reduced to their underlying variables because they are interdependent
2. exhibit nonlinear behavior with both positive and negative feedback loops acting on variables in different ways, making behavior and outcomes difficult to predict
3. often exhibit some degree of path dependency based on initial ordering of variables, but the underlying ordering is susceptible to change over time
4. exhibit emergence oftentimes emanating from systemic interaction among underlying variables rather than from a central control mechanism
5. are prone to introducing deviations in underlying variables, which can lead to bursts of unexpected and disruptive change to the equilibrium and the emergence of new path dependent trends
6. typically require a trans-disciplinary research approach given the range of systems and subsystems comprising them<sup>66</sup>

There is a whole lot packed in these six attributes, and each aspect will be progressively discussed with examples throughout the subsequent chapters. For SOF, the most important take-away is the realization that:

1. the traditional, linear planning process is ill-suited for inherently social challenges
2. there really is not such a thing as an “end state,” just deviations in the system leading to new paths
3. social problems require experience far beyond the military’s area of expertise

The reason the SDW focuses heavily on appreciate the context is precisely due to the last point—it is impossible for any single organization or individual to fully comprehend the dynamics of a system, or even worse, a system of systems. At best, each person can come to an appreciation based on his or her own education, experience, and judgment, but it will be unavoidably limited. Working together in teams with divergent perspectives improves the chances for identifying the broad range of systemic trends and interactions.<sup>67</sup>

Such is the nature of SOF-oriented, population-centric complex activities or problems. They often fail to respond to our initiatives in expected ways because there is often insufficient appreciation of the context of the underlying dynamics. Do not despair, though, it is not just SOF dealing with this problem. In fact, scholars in the urban planning discipline figured this out back in the 1960s—it has just taken 50-plus years to make its way to the military. Even worse, the social sciences, political science among them, continued to predominantly reinforce the reductionist and rationalist forms of scientific inquiry well into the 1990s. It has only been in the last 15 years that the perspective introduced here has become more prominent in the social sciences.

In fact, urban planners in the 1960s came to describe some types of complex challenges as wicked problems (see fig. 7). Just as the U.S. was about to triumphantly win the technical marvel of the space race against the Soviet Union, it began to experience urban riots in the mid-to-late-1960s. Urban planners had successfully applied reductionist scientific principles for decades in the cities, solving numerous public health, transportation, and sanitation issues, but still some populations resented their expert, rationalist efforts.<sup>68</sup> The scientists could not understand why until Horst Rittel in 1967 succinctly identified the differences between the technical sciences and the social sciences.<sup>69</sup>

In short, Rittel observed that social problems could not be solved by reductionist approaches supported by rationalist assumptions. With the notion of “problem solving,” reductionism and rationalism require what is called a closed system and a single perspective of rationality. To reiterate, solving a problem assumes that variables A and B go together in such a way as to produce outcome C. What Rittel pointed out is that in social systems, variables A and B could produce outcome Z because variables J, R, and T were not known to somehow impact variables A and B. More importantly, Complex Adaptive systems theory argues that variables A and B could not be isolated from the systems containing variables J, R, and T even if desired.<sup>70</sup>

Social systems defy the ability to control the variables and, therefore, control cause and effect. Instead of viewing the systems as something that can be a closed system for scientific research to experiment with cause and effect, Rittel adopted the perspective that it is necessary to start with the notion of social systems being open systems and, therefore, subject to different standards of scientific inquiry. This is truly the stuff of the complex

## Wicked Problems

1. There is no definite formulation of the problem because it operates in a continuous feedback loop with its environment—it forever adapts in an open system.
2. There is no stopping rule, meaning the problem can never be reduced to its base variables.
3. There is no criteria for correctness in that there are no objective criteria for judging whether solutions are right, wrong, good, or bad. New realities simply emerge from the actions taken as a result of the solution concept.
4. There is no way to test the quality of a proposed solution since an experiment can never be completely reset to the original starting conditions.
5. There is no ultimate test of a solution, only implementation.
6. Once committed to a solution and a plan of action, consequences are permanent and cannot be undone.
7. There is no completely fixed list of permissible activities, just ones constrained by prescription or proscription.
8. There are no well-defined solutions, just options that result in new emergent trends.
9. Every wicked problem is unique making SOPs and doctrine conditional instead of authoritative.
10. The problem solver has no right to be wrong since actions have real consequences to the lives of others.

Figure 7. Characteristics of Wicked Problems. Adapted from Rittel and Webber (1973) and Skaburski (2008).

domain in the Cynefin Framework. Rittel and Webber even go so far as to say social problems cannot be “solved,” just “re-solved” as new problems inevitably emerge from previous “solutions.”<sup>71</sup>

The challenges associated with rationalism and the assumptions underlying them were previously touched upon—rationality depends on perspective, so assumptions are context dependent for each person. Sure, groups of people might be generally disposed to similarities in rational thought if they are socialized in similar ways or incentivized to prize certain things over others. This is not about Maslow’s Hierarchy of Needs and such. This is not the level of social complexity addressed here. The real issue is how people mentally reconcile their gut need to scientifically reason their way through open systems when open systems undermine just about everything taught about cause and effect from middle school on up.

## **Closed versus Open Systems**

Pretty much all military planning starts with the intent to achieve an end state, but the whole idea of an end state rests on the idea that the variables can be controlled to achieve an outcome. For instance, the JPP and the Military Decision Making Process (MDMP) both assume the commander provides guidance on a desired end state and then directs the staff to identify key variables essential to the enemy’s Center of Gravity (COG). In other words, military planning is rooted heavily in a systematic, reductionist analytical process derived from traditional scientific and engineering practices. The thing is, this process works for some applications. In fact, it is stellar inasmuch as it gets an amazing number of scattered people to synchronize their efforts to achieve a military outcome over a short period of time. Yet, the planning process never yields an actual end state, just a series of future beginnings.

In contrast, take a rocket for a moment—the epitome of man’s conquest of nature through the scientific method. A rocket is an enormously complicated piece of machinery with hundreds of subsystems interacting in a precise, balanced ballet to keep the astronauts within the vessel safe despite being beset upon by the harsh, unforgiving, crushing environment of space. It is complicated in Cynefin terms—not complex—because cause and effect are known for each subsystem, though it literally takes a multitude of rocket scientists to appreciate the totality of the undertaking. Nevertheless, a rocket

is an enormous closed system. While it contains hundreds of subsystems, each operates according to predictable principles of physics, chemistry, and engineering. The principles are clearly predictable because at some point researchers in laboratories reduced and controlled all the variables in the subsystems, tested them under a variety of physical stresses, and built the components of the subsystems to precise operational specifications. Beyond that, each subsystem in the rocket is layered with monitors and sensors to ensure it functions properly to keep the astronauts safe. But it does not stop there. The closed system also contains water, food, cleaning supplies, fuel, and oxygen in sufficient quantity to return the astronauts safely to Earth. Every element of the rocket is predictable and mathematically quantifiable, from the weight of the rocket and all its equipment to the amount of fuel needed to launch it into orbit and return it safely, to the number of minutes of oxygen the astronauts have to breathe. In the end, there is a right answer to the puzzle of how the system works, every subsystem is linear and reducible, and there is a logical point at which the mission fails should the math not balance.

JPP and MDMP were brought back into the discussion as a reminder of just how pervasive the idea of a closed system is in military culture. The mindset and scientific principles underlying the ability to travel safely to space are also the same ones that led to the formulation of military planning. But just like the urban planners of the 1960s, military professionals are now coming to recognize that population-centric operations, such as COIN, irregular warfare (IW) and UW, defy the clean, sterile reductionism and rationalism JPP and MDMP intrinsically presume.

A closed system perspective assumes that the units comprising the subsystems do not have the ability to change themselves (see fig. 8). In the example, the rocket is a rigid structure. It might be able to adapt to external stresses and return to an equilibrium condition<sup>72</sup>—that is, achieve internal stability—but nothing in the rocket is going to change how the units and system work. An open systems perspective, on the other hand, accepts that the units comprising the subsystems do have the ability to intentionally change themselves and that the external environment can introduce new properties that impact interactions among the units and subsystems. Both sources of change can lead to evolution in the system, causing the system to behave differently over time (see fig. 9).<sup>73</sup>

### Conditions for Closed Theoretical Systems

1. All relevant variables can be identified.
2. The boundaries of the system are definite and immutable; it follows that it is clear which variables are exogenous and which are endogenous; these categories are fixed.
3. Only the specified exogenous variables affect the system, and they do this in a known way.
4. Relations between the included variables are either knowable or random.
5. Agents (whether individuals or aggregates) are treated atomistically.
6. The nature of agents is treated as if constant.
7. The structure of the relationships between the components (variables, subsystems, agents) is treated as if it is either knowable or random.
8. The structural framework within which agents act is taken as given.

Figure 8. Conditions for Closed Theoretical Systems.<sup>74</sup>

The open systems perspective introduces a nasty wrinkle in the way Americans have been brought up to view the world. People create things, like rockets, organizations, non-profit charities, sports teams, etc. We call these things, structures. There's a chicken-or-the-egg problem here. It takes a group of people, called agents, to initially create every structure. Every person who experiences the structures thereafter thinks they are just part of the reality—they are just normal. So, the chicken-or-the-egg problem is formally called the agent-structure debate;<sup>75</sup> which comes first, the structures into which agents were born, or the agents who created structures into which subsequent agents were born? The answer is, it does not really matter for the purposes of this discussion. Pick a starting point and go with it. Just know that causal predictability in the social realm is a canard.

The key take away is that cause and effect are unpredictable in the complex and chaotic domains precisely because the variables (people or agents) in the system are constantly changing as they adapt to a constantly changing structure. It is a wicked feedback loop that makes causal predictability nearly impossible. By now much of the frustration many experienced on deployments to Iraq, Afghanistan, and other locations is likely making more sense. The planning process set in play expectations about how to achieve end states that were unlikely in the first place. Both Afghanistan and Iraq were extraordinarily open systems since the governance structures were so damaged.

The idea of an open system is a significant departure from the standard expectations arising from training in the traditional scientific method and is well outside a typical military professional's formal education. The closed system mindset is one of the most significant blinders affecting the force today. It is almost pernicious, not in a malicious way, but in the way it prevents alternative appreciations of the context from forming because it is so unwaveringly accepted as "the way the world works."

### **The Limits of Perfect Knowledge and the Need for Appreciating the Context**

Ok, that was a lot to digest. Most readers probably took away some key points and left some other nuggets out. This happens because of the filtering issue mentioned in chapter 1. But it is an important result of the biological response to confronting social and conceptual complexity. Humans inevitably satisfice when it comes to seeking out and retaining information. The term satisfice is a blend of the words "satisfy" and "suffice."<sup>76</sup> In the end, there is so much going on in the day and there are so many data points competing for attention, the mind only permits a search for information to the point one is satisfied there is sufficient knowledge to make a decision. Whether searching for the best price on a new car or trying to figure out how to destroy a terrorist network, ultimately action must be taken at some point and the decision happens when one thinks there is enough information, not when one objectively has all information physically in existence.

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*Humans inevitably satisfice when it comes to seeking out and retaining information.*

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## Conditions for Open Systems

### Real-world systems

1. The system is not atomistic; therefore at least one of the following holds:
  - a. Outcomes of actions cannot be inferred from individual actions (because of interactions).
  - b. Agents and their interactions may change (for example agents may learn).
2. Structure and agency are interdependent.
3. Boundaries around and within the social or economic system are mutable; for at least of the following reasons:
  - a. Social structures may evolve.
  - b. Connections between structures may change.
  - c. The structure-agent relation may change.
4. Identifiable social structures are embedded in larger structures; these may mutually interact, for the boundaries of a social system are in general partial or semi-permeable.

### Implications for theoretical systems

5. There may be important omitted variables or relations and/or their effects on the system may be uncertain.
6. The classification into exogenous and endogenous variables may be neither fixed nor exhaustive.
7. Connections and/or boundaries between structures may be imperfectly known and/or may change.
8. There is imperfect knowledge of the relations between variables, relationships may not be stable.

Figure 9. Conditions for Closed Theoretical Systems.<sup>77</sup>

There are many reasons why the search for perfect knowledge is broken off. Some have to do with time constraints. War is dynamic and those who seize the initiative have the advantage. In less kinetic circumstances, everyone has arbitrary deadlines the boss sets. Others have to do with personality. Type A personalities make quick decisions and value decisive action. It is actually painful for many to sit and admire a problem beyond the point of satisficing. This is not a criticism, just a common personality trait. Still others have to do with competing priorities. People simply do not have the time or resources to achieve perfect knowledge even in the absence of deadlines or personality quirks.

Unsurprisingly, the reductionist and rationalist approaches typically assume the ability to achieve perfect knowledge. From the reductionist perspective, it is the only way to determine causation in a scientific experiment. Any indication of variance from predicted outcomes is further evidence that some other variable exists and must be sought out thereby reducing to yet another level. From the rationalist's perspective, individuals must have perfect information to make rational decisions. The notion of satisficing put a big hole in the rationalists' perspective, so they modified the model with the idea of bounded rationality,<sup>78</sup> which incorporates the satisficing concept with mathematical precision. A Complex Adaptive Systems approach suggests both of these perspectives lose coherence in the real world because the way variables interact across open systems is irreducible, and individuals consequently never actually achieve perfect knowledge.

The basic tools and vocabulary to think anew about the population-centric, social problems SOF are tasked to address are now on the table. Social problems tend to be complex, potentially even wicked, and they challenge the scientific notion of prediction. They emanate from multiple, overlapping systems of people (agents) interacting in such a way that they can intentionally order—and more importantly re-order—their own environments (structures), which leads to new patterns of behavior over time. The systems of agents and structures are also affected by phenomena external to them and respond oftentimes through new innovations or evolutions arising from changes in how the systems interact or among the relationships between the agents forming the structures.

Once again, the notion of cause and effect underpinning traditional military planning becomes problematic when closed system assumptions are questioned. The military's cultural reliance on system 1 thinking is similarly

problematic because it enables personal and organizational blinders to take hold when system 2 thinking is necessary for wicked problems. The limits to perfect knowledge also reinforce the absolute requirement for an appreciation of the context with diverse and divergent perspectives. Absent a process for incorporating broader system dynamics, reality will unforgivingly introduce shocks as people move out with their own limited perspectives and assumptions. Chapter 3 builds on this conceptual foundation to explain the limits to prediction in the social world that are often obscured in the way science is taught. For SOF to deal effectively with complexity dynamics, it is crucial to understand how science is coming to grips with its own blinders.

### **Key Terms**

Cynefin Framework, sense-making models, reductionism, rationalism, closed system, open system, agent-structure debate, satisfice, bounded rationality

### **Summary**

- The Cynefin Framework is a sense-making model for determining the nature of a problem and the appropriate responses based on whether cause and effect can be determined.
- Wicked problems occur in open systems where neither the number of variables impacting a system nor the relationships among them can be known.
- The appreciate the context element of SDW is so important because it is impossible for a single person or a small group to understand systemic dynamics based on personal experiences. Working together in teams with divergent perspectives improves the chances for identifying the broad range of systemic trends and interactions.
- Reductionist and rationalist approaches, which underlie operational design and planning, are ill-suited to address wicked problems because they presume cause and effect can be known.
- The SDW guards against the effects of satisficing and bounded rationality by emphasizing system 2 thinking over system 1 thinking.

## Chapter 3. The Mother of All Blinders: Prediction in Open Systems

So, why is it important to know whether an operating environment is complicated or complex, whether cause and effect can be determined, whether or not all the variables can be known, and whether the system is closed or open? In the end, it is all about whether the future can be predicted. Most people born in Western societies have been brought up to believe that nature can be conquered, destiny made, and the future foreseen. To a certain extent, this is true. But there is a kink in all this. Most Americans have also been raised to think that the future can be predicted in a scientific manner—and that it should be attempted—just as the scientific method is used to predict outcomes in the physical sciences. As mentioned earlier, this in essence is the perspective underlying JPP and MDMP.

For the U.S. military, and the USG more broadly, the belief in prediction in the social realm is the “mother of all blinders.” The affinity for prediction is more an American cultural phenomenon than a function of government culture per se. However, there is a clear bias within the USG that emphasizes the rational use of taxpayer resources based on predictive analysis over the irrational use of resources based on intuition and experimentation.<sup>79</sup> Who can argue against that? Unfortunately, to some degree this monograph must, in order to place the mother of all blinders in historical and philosophical context.

At the heart of prediction lies the essence of linear thinking. Linear thinking at its core is the unstated, often unconscious, assumption that all things in nature can be known if there is perfect knowledge of variables and the dynamics of cause and effect. Determining the variables and the consequences of their interactions lead to logical “if X, then Y” statements in a relatively straightforward, historically progressive—hence linear—way. Thomas Kuhn, one of the twentieth century’s most notable thinkers about science as a practice, observes that scientific disciplines often create the illusion of a linear path to knowledge creation as they explain their histories in textbooks. He writes:

For reasons that are both obvious and highly functional, science textbooks ... refer only to that part of the work of past scientists that can easily be viewed as contributions to the statement and solution of the texts' paradigm problems. Partly by selection and partly by distortion, the scientists of earlier ages are implicitly represented as having worked upon the same set of fixed problems and in accordance with the same set of fixed canons that the most recent revolution in scientific theory and method has made seem scientific ... *The result is a persistent tendency to make the history of science look linear or cumulative, a tendency that even affects scientists looking back at their own research* [emphasis added].<sup>80</sup>

In reality, Kuhn writes, scientific advances proceed along two different paths which, while cumulative, are not necessarily linear. He calls the seemingly straightforward, historically progressive path “normal science,” whereby scientists engage in the grind of the profession—conducting experiments, recording data, searching for causal relationships, testing hypotheses, etc.<sup>81</sup> In more general terms, normal science is about solving the puzzles confronting humanity.<sup>82</sup> Advances in knowledge are most certainly achieved through this process, and this path generates the stereotypical view of the lab coat scientist making gradual but steady progress with new discovery. The military version of normal science is doctrine—it tells the force what it is supposed to do, orients education and training around specific tasks, and provides handy tools to accomplish accepted military objectives.

But the grind of science is made possible by the second kind of advance—through the competition of paradigms. Paradigms are how scientists see, feel, and sense the world around them, which is typically conditioned by what textbooks teach them exists in the world.<sup>83</sup> Paradigms constitute the dominant theories of causal relationships, their application to research, the nature of the puzzles to be solved, and the types of instrumentation and tools required to address them.<sup>84</sup> Recent competing military paradigms include the revolution in military affairs, COIN, and cyber warfare. It is not that any single paradigm is right or wrong, each just addresses a different aspect of war.

Kuhn revealed an extraordinary paradox in scientific advances: while normal science does achieve an almost linear accumulation of knowledge with immediate impact on daily life, the advances in paradigms that make

those normal science and technological discoveries possible often occur through nonlinear revolutions in the field of study. They rarely, if ever, come from the accumulation of knowledge derived from normal science experiments. Rather, paradigmatic revolutions come as a shock by scientists coming to perceive, or in SDW terminology, appreciate, the puzzles from a different perspective or with a different perception born of experience outside the practices of the “professionals.”<sup>85</sup> Often the revolutions in knowledge occur because they are initiated by younger members of the profession who are not wedded to the blinders imposed upon them by the patriarchs of the existing paradigm.<sup>86</sup> Shocks leading to advances in scientific knowledge, Kuhn concludes, have overwhelmingly been about how scientists perceive and interpret the world around them. Such discovery has been nonlinear in nature and the result of different appreciations of the context in which questions were asked and the lenses through which the questions were viewed.<sup>87</sup>

For those only taught the linear view of scientific discovery, deficits in predictive capacity are not failures of the scientific method; rather, they are indicators of the immaturity of the particular scientific discipline.<sup>88</sup> In the social realm, it is the belief that life unfolds along a relatively defined path. The trick to prediction in this case is to identify all the variables impacting life along the trajectory. Any error in prediction is assumed to be rooted in a flawed formula, imprecise data, or a logic defect in the theory. Renowned philosophers in the nineteenth and twentieth centuries built entire careers and followings based on the premises of linear thinking. Indeed, the social sciences spent the better part of the twentieth century refining theories of society and mankind based on their tenets.<sup>89</sup> Only in the last part of the twentieth century did it become more common to find scholars emphasizing that the social world is not comprised of puzzles with correct solutions, but novel, emergent currents to navigate.<sup>90</sup>

Linear thinking is so intrinsic to American culture that it is knowable only by the pain associated with trying to think in nonlinear terms. To think nonlinearly, one must distinguish between regularized patterns in human behavior that appear predictable and the capacity of the variables to intentionally change.<sup>91</sup> Kiel writes:

Nonlinear systems are evidenced by dynamic relationships between variables in which the relationship between cause and effect may not be proportionate. Thus, in nonlinear systems seemingly minor

changes or disturbances may generate positive feedback, or amplifications, resulting in wholesale structural and behavioral change. Such change may result in a variety of possible outcomes. These outcomes may range from new states of equilibrium to novel states of increased complexity and organization, or even to ‘chaos’ in which predictability and organization break down.<sup>92</sup>

Everyone experiences time linearly as life unfolds along what on the surface appears to be a straight line—as though things only could have happened the way they did. This makes life seem predictable even though, all along the way, little perturbations in a person’s circle of life have changed the way he or she thinks, acts, or views interests with important cumulative effects. For perspective, imagine again what life would be like nowadays if cellphones and the internet had never been invented or government regulation purposefully squashed them in their infancy—truly alternate, viable, nonlinear universes. In other cases life is hit by a significant, unforeseeable Black Swan event that changes everything. Nonlinear thinking simply recognizes that the seemingly linear path of life, in fact, unfolds in a nonlinear way and will continue to do so. The only real solution is to accept it, adopt attitudes and behaviors that anticipate it, and figure out how to navigate it.

This chapter walks through the origins of linear thinking as a means of highlighting the conditions for which it is appropriate and why social problems undermine the predictive process. To do so, it briefly reviews the American cultural fascination with science and how it shaped the U.S. education system and culture over the twentieth century. It then discusses why the social sciences seem to have varying degrees of success with predictive analysis in the social realm with an objective of teasing out the nuances of causal analysis in open systems. In the process it exposes some fundamental problems with the highly linear concept of existing military planning. This is not to say there is not value in it—there most certainly is. But existing military planning principles must be put in proper context to prevent misapplying them.

## **The Enlightenment Hangover**

The United States of America was born as an experiment during a grand era of discovery. Through extraordinary advances in philosophy and scientific method, the Age of Reason and the Age of Enlightenment ushered in a belief

system whereby man could overcome his reliance on superstition, begin to understand and measure the natural world, and bring political order to the masses through the application of principled logic. Such philosophical fundamentals as empirical measurement, rationalism, the scientific method, and the basic tenets of classical political liberalism took shape between 1600 and 1800 A.D. The goal of the philosophers straining against nature was to make a seemingly unpredictable and tenuous life more predictable and pleasant.<sup>93</sup>

For Americans, the tangible benefits of this intellectual tradition were immediately apparent from the political foundations of the country to early advances in industrial technology. For context, until the early nineteenth century the entirety of humanity had relied for movement upon its own feet, those of animals, or the currents of the winds and waves. By the 1820s, steam power and the science associated with engineering, physics, and chemistry transformed human existence forever because man conquered the limits of speed and power imposed by nature. America, as much as any country in the world, adopted the philosophical and educational attributes of the Enlightenment period and continued to exploit, research, and perfect the application of science to life and industry. In many ways, the scientific revolution of the 1800s fueled America's economic growth, greatly impacted its wars, and set in motion its meteoric rise in the international system. Sixty years after the widespread introduction of steam power, Americans invented the commercially viable light bulb, and 25 years later were flying. In just another 50 years, Americans were rocketing into space, masters of the seas, splitters of atoms, and citizens of the most economically influential country in history. Despite some important hiccups, a causality-based, empiricist, and seemingly linear scientific method made America much of what it is today.

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*In many ways, the scientific revolution of the 1800s fueled America's economic growth, greatly impacted its wars, and set in motion its meteoric rise in the international system.*

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Around the 1870s universities started programs of study in the social sciences due to the predictive power of the scientific, empirical methods evident in the physical sciences. There seemed to be no reason to think that society and politics would be immune to the scientific method of causal discovery.<sup>94</sup> Advances in statistics, logic, sociology, psychology, and philosophy all contributed to the belief that social problems could be systematically reduced to their root variables, analyzed, mathematically represented, and resolved

in practice just as occurred in the physical sciences.<sup>95</sup> The gradual expansion of mass public education over the course of the twentieth century further reinforced the rational, empiricist image of science, be it of the physical or social variety. Today the term ‘science’ is almost universally equated with the scientific method rooted in linear, causal, reductionist analysis. As an American cultural feature, the idea of science is an almost uniformly understood reality. Truth be told, however, the science discussed and taught in the public sphere relates to only one, relatively constrained aspect of reality—closed systems.

By the beginning of the twentieth century, educators were trained to think in scientific terms, and giants such as John Dewey (of Dewey Decimal system fame) helped bring order and structure to learning.<sup>96</sup> Political scientists, sociologists, social psychologists and others reproduced the scientific method practiced by the physical sciences, such that they were described as having “lab coat envy.” Social scientists adopted the tried and true methods of the physical sciences, including controlled experiments, theory testing, statistical modeling, and reducing complex social phenomena to mathematical formulas.<sup>97</sup> Unlike the physical sciences whose discoveries and laws work across locations (and galaxies in some cases), the social sciences experienced extraordinary difficulty deriving laws of human nature capable of predicting behavior and outcomes even within the same country over time and place.<sup>98</sup> While there were voices airing concerns about the nature of social science throughout the twentieth century, the social sciences pushed forward under the premises and standards of the scientific method.<sup>99</sup> Today, there is grudging acknowledgement in the social sciences that the hard science methodology is somewhat problematic for its problem set—open systems.<sup>100</sup>

For the military, it is important to note that the Service academies are heavily invested in the physical sciences, and for good reason. The engineering and technological challenges with which the military must contend require strong grounding in the principles of physics, chemistry, geometry, and other hard science disciplines. However, the unintended consequence of educating the force so heavily within a physical science perspective is that it reinforces many of the cognitive biases associated with the hard science methodology. Many of the difficulties SOF have experienced since 9/11 have been the result of applying closed system, linear thinking to inherently open system, nonlinear problems, and the SDW can help resolve these

contradictions. It is not the gods who are crazy—it is actually just the mother of all blinders that makes it seem that way.

## Hard Science versus Social Science

The Enlightenment hangover entices Americans to expect that the world conforms to (a) the principle of prediction, (b) the reducibility of phenomena to root variables, (c) the discoverability of cause and effect, and (d) the progressive accumulation of knowledge through the scientific method. The hard sciences have experienced such tremendous success following this premise because they are able to achieve causal predictability and the replicability of results that enable scientists to derive laws of nature.<sup>101</sup> As discussed in chapter 2, the variables in the hard sciences can be controlled and held constant while the conditions of experimentation can be reset identically every time. The law of nature manifests because scientists can achieve a statistically significant result—statistically significant because there is always minute variation—such that they can have confidence moving forward that their predictions will come true. Because the variables can be controlled, the emphasis is on the rigor of following the best practices arising from the scientific method to credibly add to the body of knowledge on cause and effect. The basic nature of the hard sciences operating in closed systems is not even a thought—it simply is “science.”<sup>102</sup>

Laws of human nature have eluded the social sciences because there is a fundamental flaw in the assumption underlying the scientific method. Unlike the variables in the hard sciences which are reducible and knowable, the variables in the social sciences—people and the institutions they create—have the agency to decide how to act, to change themselves, and construct new relationships that alter the nature of the system in which they operate.<sup>103</sup> This flips the notion of laboratory replicability, upon which the hard science method is entirely based, on its head.<sup>104</sup> As Barton, Stephens, and Haslett note “laboratory science is a ‘special case’ of social science,” because in nature people live in open systems and variables cannot be controlled as in a closed system.<sup>105</sup>

To reduce “science” only to the hard science methodology is to engage in an egregious error of logic and philosophy. While it does have applicability to social science and can offer insight about human biological and social phenomena, it is problematic if taken out of proper context. Laboratory

studies and controlled experiments can produce informative results, but expectations must be measured when it comes to the social sciences and predictive analysis once subjects return to the natural, unconstrained, open environment.

So, what is the best way to think about social science given the contradictions between the assumptions of the scientific method and the reality of social experience? The answer lies in the attitude adopted to deal with the uncertainty inherent to open systems. The best the social sciences can hope to achieve is an approximation of casual inference, meaning cause and effect can never truly be known in an open system, so the focus is on the process of conducting science to arrive at an interpretation of cause and effect.<sup>106</sup> King, Keohane, and Verba describe the essence of the issue:

Holland refers to this problem as the fundamental problem of causal inference, and it is indeed a fundamental problem since no matter how perfect the research design, no matter how much data we collect, no matter how perceptive the observers, no matter how diligent the research assistants, and no matter how much experimental control we have, we will never know a causal inference for certain. Indeed, most of the empirical issues of research designs that we discuss in this book involve this fundamental problem, and most of our suggestions constitute partial attempts to avoid it.<sup>107</sup>

The reader might think these scholars are social science skeptics. Quite the contrary, these are some of the most notable political scientists of the late-twentieth century. Indeed, they believe that the systematic rigor of social science is essential for generating knowledge on the human condition with the goal—however uncertain—of arriving at causal inference. Otherwise, all social life is left being a novel, unique experience for which casual observation is sufficient.<sup>108</sup> They are honest about the discipline and simply want students of social science to adopt rigorous standards and subject their research to scrutiny.

## **Correlation versus Causation**

Return again to the requirement to distinguish between the regularized patterns of human behavior that offer the appearance of predictability and the ability to statistically predict behavior. The fact is there are patterns of social

behavior which philosophers and social scientists across the centuries have described as regularities, uniformities, generalizations, patterns, or classes of events.<sup>109</sup> To the extent that people (agents) continue to behave as a group in accordance with legal (formal) or normative (informal) structures, it is possible to meaningfully simplify social complexity to patterns to derive some degree of causal inference. King, Keohane, and Verba continue:

There is no choice but to simplify. Systematic simplification is a crucial step to useful knowledge. As an economic historian has put it, if emphasis on uniqueness 'is carried to the extreme of ignoring all regularities, the very possibility of social science is denied and historians are reduced to the aimlessness of balladeers.'<sup>110</sup>

The authors agree with this in principle, but there is a further caveat. As Kuhn warns, all science is first and foremost a matter of appreciation—the paradigm through which one views something creates filters and lenses emphasizing certain aspects while obscuring others. This truth is amplified in the social sciences because social regularities and patterns are fundamentally different than those occurring in nature. In short, what exists as a regularity in the social sciences is dependent upon what its scientists perceive, how they talk about it, and how they design their tools to measure the regularities they perceive.<sup>111</sup> This is most certainly true in the military context as well. For example, how often did SOF or conventional forces enter a village in Iraq or Afghanistan and immediately ask if there was a school, clinic, or well that needed building because doctrine told the force those features were essential to promoting government legitimacy? While there might be a correlation, those features are not causal to government legitimacy.

King, Keohane, and Verba use the term causal inference because, in the social sciences, it is not possible to establish causal predictability like in the physical sciences. The best result, then, is establishing a correlation between the regular patterns of behavior perceived on a daily basis and the variables hypothesized to be driving them. The appearance of stable, repeated, often uniform behavior allows researchers to anticipate phenomena at higher levels of abstraction, and there is utility in the correlations developed, such as the likelihood of a traffic accident at certain intersections when it rains. It is not possible to know who will be in any given accident or the decisions setting it in motion, but just understanding the correlation can be useful. Again, the danger in an open system lies in assuming that the science behind a

convincing correlation is in fact predictive when the underlying variables are actually always in flux.

The dominant paradigm across the USG—the belief system underlying system 1 thinking—is that predictive analysis is possible in the social realm. There are numerous vendors, academics, and research institutes dedicated to this proposition, and there is a significant pot of money supporting the effort. Additionally, many claim that all the variables needed to predict the social future are available on the internet and simply require big data solutions to identify them. In the simple domain of the Cynefin Framework, this could work, but in the complex domain, this proposition is highly problematic. The authors hope that the preceding discussion on causal inference and causal predictability place the enthusiasm in proper context, but offer a few relevant contemporary examples below as to why.

### **Statistics, Patterns, and Humility**

Two recent examples on the limits to prediction in the social world instantly come to mind. The first is the global financial crisis of 2008 and the second is the 2016 U.S. presidential election. The former represents perhaps the most heavily modelled, data rich, and statistically elegant sector on Earth, while the latter represents the epitome of social science, scientific polling. In both cases the emphasis was on prediction and the result in both cases was complete surprise when the statistics failed to come true.

Financial transactions are among the most reported, regulated, and detailed social activities humans undertake, which make them perfect for predictive analysis. In fact, large financial firms employ extraordinarily sophisticated econometric models (imagine statistics with calculus) to predict the opportunity and risk associated with various financial vehicles.<sup>112</sup> During the 2000s, the housing boom was in part fueled by low interest rates and easy access to home mortgage loans.<sup>113</sup> Many mortgages were guaranteed by the USG through the public-private companies Fannie Mae and Freddie Mac, but private-sector subprime lending companies, such as Countrywide, also contributed heavily to the mortgage bubble.<sup>114</sup> Fannie Mae and Freddie Mac essentially made loans affordable to low income purchasers by reducing their interest rates through the provision of loan insurance to the lenders backed by the USG<sup>115</sup>—in short, the lenders could not lose.<sup>116</sup> Statistically, the low interest rates were supposedly valid because Fannie Mae and Freddie

Mac retained sufficient reserves to pay off the bad debt of defaulting purchasers based on historical averages.<sup>117</sup>

Financial investment firms in turn bundled real estate investment vehicles of varying degrees of risk and interest rates together to resell them as a product called “securities” and risk hedging vehicles called “derivatives.”<sup>118</sup> The investment firms, some of the largest financial firms in the world, predicted the rate of default and the risk of exposure through advanced econometric modeling, and this worked because the patterns of behavior—the regularities (expected patterns) on the default of home loans—persisted ... that is, until they stopped.<sup>119</sup> By late 2007, it became clear that the economy was cooling down and many home purchasers could no longer afford their loans, so the loan default rate skyrocketed. Large commercial financial firms like AIG and Lehman Brothers, and the government-backed Fannie Mae and Freddie Mac failed to bolster their cash reserves in the years preceding to sustain the default rate,<sup>120</sup> which caused them to go bankrupt—instantly destroying the amazingly sophisticated econometric models underlying derivatives and, by extension, the entire financial system. All at once, few if any of the statistical models detailing the financial asset and risk positions of some of the largest financial firms on Earth could predict the future, and the global financial system almost completely collapsed because the firms could not determine what their assets were actually worth.

Similarly, scientific polling has been a staple activity of the social sciences and even marketing firms for more than 75 years. The golden era of polling in the United States occurred from about the 1960s to the mid-1990s when random phone dialing ensured a reasonably good random sampling of the population since everyone used land lines and caller ID was not pervasive. By the mid-to-late 2000s, when cell phones and caller ID became almost universally available, scientific polling started experiencing significant problems—people were opting out of the sample when they did not recognize the phone number. Scientific polling became susceptible to response bias, meaning the researchers had to adjust—guess, really—the true proportional rate of response and recalculate their results accordingly.<sup>121</sup>

In the 2016 U.S. presidential election, early poll results conclusively showed Republican candidate Donald J. Trump had almost no chance of winning the election in a head-to-head match-up with Democrat Hillary Clinton.<sup>122</sup> These results persisted through the primaries and into the general election. On the eve of the election, pollsters and news organizations

overwhelmingly concluded that Hillary Clinton would win in an Electoral College landslide with the question just being the size of the margin ... that is, until she did not.<sup>123</sup> Despite the decades of election data, the almost daily polling activity, and the expertise of the political pundits, their paradigms and models generally failed to predict the actual outcome, President Donald J. Trump, 45th President of the United States in an Electoral College landslide.

Throughout the primary election, political campaign experts and news pundits repeatedly used some variation of the phrase, “I’ve never seen anything like this.” Essentially what they were saying is that their paradigm

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*In fact, all scientific polling makes assumptions about the percentages of respondents relative to the actual reality, so they always recalculate their results to match their beliefs (predictions) about voter behavior.*

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of American politics—their underlying assumptions, expectations, and knowledge of the regularities and patterns of American voter behavior—were not able to model the behavior of a significant portion of the voting population. In fact, all scientific polling makes assumptions about the percentages of respondents relative to the actual reality, so they always recalculate their results to match their

beliefs (predictions) about voter behavior. They often research recent elections for causal inference to model results, which means there is always an element of bias and random error.

The random error is statistics-speak for the impact of the open system—there are things going on below the surface or problems in the sample or the experiment that make the results susceptible to error typically to a magnitude of 3.5 percent–4.5 percent. In the hard sciences, this is generally unproblematic because the variation can be attributed to some variance in the environmental conditions so long as the results are replicable 95 percent of the time or more. Results outside the norm are thrown out as outliers and not statistically significant. When social science follows suit, it potentially throws away the more interesting nugget, that indicator of change on the horizon.<sup>124</sup> Kiel summarizes well the logic and consequences of doing so:

Such a focus of course is intended to afford a generalized picture of the phenomenon examined. Average behavior also is seen as important since it serves as a source of system stability that reinforces

existing structural arrangements. Yet, investigations of nonlinear systems ... reveal that it is nonaverage behavior that often serves as an impetus for the amplification of nonlinearities and the potential for dramatic change. Seemingly minor changes can have unpredictable and massive effects in nonlinear systems ... Errors that initially appear minor may drive nonlinear systems to unexpected and unwelcome outcomes.<sup>125</sup>

All of this is to say that it is possible to observe patterns in open systems and to model them scientifically, but there is extraordinary risk associated with thinking the models are truly predictive in the same way as in closed systems. Even the best, most pragmatic social science statistical models are based on paradigms that only partially reveal aspects of reality—they inevitably overlook factors subtly changing the variables below the surface over time (more on this in chapter 4). Appreciation of the context is so important in the SDW because it highlights the fact everyone brings their own paradigms to the table, and the ethic of Appreciation is that each person's perspective is always incomplete. Predicting behavior depends on sensitivity to the systemic interactions affecting patterns (regularities) at a low level, which in turn requires inviting diverse perspectives to learn how the system is being impacted and changed over time by the host of influences. Humility is essential in the SDW because each person can only ever partially model his or her own little sliver of the world.

### **Why Does This Matter to Me?**

Chapters 2 and 3 reviewed some fairly thick material, but the “so what” of these chapters comes down to this: It is about how we think about things. Whereas operational design and other planning tools reinforce a linear, causality-based mindset, design thinking highlights the fact that systemic interactions create the potential for nonlinear dynamics for which traditional statistical, variable-based, reductionist methods simply cannot account. Divergent thinking is necessary as a check on bias and system 1 thinking, especially when there is an expectation that causal analysis is possible.

American culture runs counter to the way the SDW asks the reader to view social dynamics. Americans are taught to think in causal, predictive, reductionist, and rationalist terms. Moreover, the natural, biological disposition to satisfice based on system 1 thinking leads to severely bounded

rationality even when attempting to think logically. In contrast, the SDW suggests that a more productive way to approach social reality is to expect “the pervasiveness of change, contradictions and nonlinear dynamics which stress that ‘diversity—not order—is normal.’”<sup>126</sup> The American education system and modern bureaucracy want people to cram as much as possible into the simple domain in the Cynefin Framework. Hopefully by now it is clear why this attitude contributes to so much cognitive and emotional frustration across the force.

If the assumption of linear thinking is relaxed—the idea that life unfolds along a linear, predictable path—it becomes easier to identify the opportunities to influence how the variables in a system interact. In effect, this is the essence of FID, building partnership capacity (BPC), UW, MISO, and CA. The fallacy of linear thinking within established professional military paradigms is that it often misdirects attention toward the end state and away from the systemic impact actually happening. Thinking systemically involves “an understanding of interrelationships, a commitment to multiple perspectives, [and] an awareness of boundaries.”<sup>127</sup> This is nonlinear, more circumspect, and more sensitive to lower level variables. In other words, it attitudinally empowers those dealing with wicked problems in a more productive way.

Thinking in systemic terms automatically accentuates the need for appreciation as a means of learning from one another. Each system, whether a function of culture, organization, or specialty, inculcates biases and assumptions in people through paradigmatic beliefs. The generic term for paradigms in this monograph is “blindness” because they inhibit the perception of reality in important ways. For one, paradigms tend to reinforce bias—what is often called groupthink. Additionally, the paradigms highlight certain variables deemed important while dismissing others, which in turn leads to measuring and tracking certain things while overlooking others. Finally, they tend to reinforce stereotypes based on personal and organizational experience. Local context and experience consequently matter greatly. However, the meaning and substance of experience varies depending on where one falls in the relationship of interaction. The only way to reconcile the natural, sometimes competing realities, is through a shared appreciation of the context.

It is generally uncomfortable for Americans to accept the idea of a world in which linear thinking is only conditionally applicable. It would be unsurprising for many people reading this to struggle with the notion, and that is alright. Americans are used to and comfortable with the hard sciences and

the scientific method, which are about puzzle solving—experimentation can reveal ever more precise calculations and measurements of cause and effect. Social science has no logical solution—there is no possibility of reducing it down to finite variables, so it is therefore not a matter of puzzles.<sup>128</sup> To attitudinally move past the mother of all blinders—the reliance on and desire for predicting the social future—a few more ideas need to be introduced in chapter 4 to put this discussion in context. Chapter 4 builds upon the ideal of nonlinear interactions, which is the heart of complex adaptive systems perspective, and introduces the last of the vocabulary and concepts necessary for working with systemic thinking.

### **Key Terms**

Paradigm, Regularities, Causal Inference, Causal Prediction

### **Summary**

- Paradigms condition how people see, feel, sense, and think about the world around them. They inform ideas about cause and effect and create blinders by highlighting certain aspects of reality at the expense of others.
- Prediction in the social sciences is not possible in the same way as it is in the physical sciences. The best social sciences can hope for is causal inference instead of causal prediction due to the nature of open systems.
- The existence of regularities in human behavior present the illusion of statistical causal predictability in the social sciences, but they are only temporary because of the effects of nonlinear interactions in open systems.
- Appreciate the context in SDW offers the best potential to identify possible nonlinear effects to mitigate the impact of incorrect assumptions.



## Chapter 4. Heresy! The Desired Future as the Alternative for End States in Open Systems

The implication of the preceding chapter is that engaging in knowledge creation or prediction outside the use of the scientific method is typically considered unscientific. This stereotype also holds true in terms of military planning since it is rooted in engineering concepts. But this critique only holds if the hard science model is accepted as the gold standard.<sup>129</sup> There are most certainly cases where it is.

In the environments in which SOF typically operate, this is much harder to assert. Think back to the Cynefin Framework for a moment. If SOF are most likely to operate in the complex and chaotic domains or seek to influence the way a system operates in the complicated domain, they by definition have to navigate through circumstances where the structures reinforcing regularities are weakened and the incentives for new and novel innovation are strong. Retired Army General Stanley McChrystal et al. argue twenty-first century warfare is heading this way, where shape-shifting, adaptive, decentralized, networked organizations gain an advantage over hierarchical, rigid, and centralized ones.<sup>130</sup> They write:

Our struggle in Iraq in 2004 is not an exception – it is the new norm. The models of organizational success that dominated the twentieth century have their roots in the industrial revolution and, simply put, the world has changed. The pursuit of “efficiency”—getting the most with the least investment of energy, time, or money—was once a laudable goal, but being effective in today’s world is less a question of optimizing for a known (and relatively stable) set of variables than responsiveness to a constantly shifting environment. Adaptability, not efficiency, must become our central competency.<sup>131</sup>

JPP and MDMP serve well for activities with bounded objectives and limited time horizons because the range of unknowns become manageable at least to some degree. But in working toward an end state, both tools reinforce a decision structure rooted in a centralized, hierarchical, linear

planning model for which the modern operating environment is poorly suited, particularly at the high operational and strategic levels.

Adopting the presumptions that prediction and moving toward an end state constitute the right approach lead to two problems: (a) they focus attention on the plan instead of how the systems of people and institutions respond and adapt to the intervention in the system, and (b) they subconsciously promote a short-term, solve-the-problem disposition. General McChrystal et al. again illustrate the subtle but important differences in perspective:

I later used a specific question when talking to junior officers and sergeants in small bases in Afghanistan: “If I told you that you weren’t going home until we win—what would you do differently?” At first they would chuckle, assuming I was joking, but soon realized I wasn’t. At that point most became very thoughtful. If they were forced to operate on a metric of task completion, rather than watching the clock until they went home, the implications would be significant. Almost all were good soldiers and leaders, but they had been shaped into thinking in terms of their tour of duty, a time horizon that rarely predicted successful mission completion.

Once they recalculated, their answers were impressive. Most adjusted their approach to take a longer view of solving the problem. You might expect them to seek a quicker solution and an earlier ticket home. But they were experienced enough to know that real solutions demand the long view—simple fixes are illusory.<sup>132</sup>

What SOF are now experiencing is very much akin to what Rittel and Webber experienced in the urban planning field fifty years ago. Public policy and planning were historically rooted in social engineering through a linear, reductionist, centrally planned model geared toward producing outputs or end states.<sup>133</sup> Rittel and Webber introduced the concept of “re-solving” problems precisely because the discipline of urban planning attitudinally expected to “solve” them in the first place.

The reason the SDW emphasizes appreciation of the context over prediction for SOF is because in many cases not even the populations SOF want to influence or the enemies SOF target know where they are heading. When the social structures are broken or breaking, regularities in human behavior start to transform, which in turn hampers the ability to discover, explain,

and predict future behavior. Additionally, adaptive enemy organizations are smart enough to build where SOF are not looking, meaning they lay out feelers and exploit as circumstances permit. It is no accident that from the ashes of al-Qaeda in Iraq grew ISIS—it adapted, waited, and expanded as its context changed to the point it now boasts a worldwide franchise.

The SDW suggests that there is a more productive way to approach thinking about the future that still moves toward the intended effect of prediction without falling into the cognitive traps associated with causal prediction in open systems, especially as the seemingly stable patterns begin eroding. The SDW uses the term “desired future” as the alternative to a traditional planning end state. Chapter 4 first describes the foundations of nonlinear relationships that frustrate the innate human desire for stability in social systems. It then introduces the concept of desired futures—more importantly, the *Range of Possible Futures*—as a means of moving toward an objective while cognitively accepting the nonlinear path likely necessary to achieve it ... or something around it. In the end, thinking systemically and in nonlinear terms offers better preparation for policies and activities in complex environments where internal dynamics and external influences converge to render end states unpredictable and uncontrollable.<sup>134</sup>

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*When the social structures are broken or breaking, regularities in human behavior start to transform, which in turn hampers the ability to discover, explain, and predict future behavior.*

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## What Middle School Science Classes Didn't Teach You

It says something about the natural human desire for stability that Americans often look back at the Cold War era as the “good old days” when Mutually Assured Destruction and proxy wars in the Third World provided a sense of order with patterns of predictable international politics.<sup>135</sup> For over twenty years, Americans have been striving to restore “stability” to the international system with mixed results at best. Emilian Kavalski concludes Americans are so preoccupied with instability in the international system because they are conditioned by concepts of linear causality to think that equilibrium is the natural condition.<sup>136</sup> As an instrument of foreign policy, SOF serve as key assets in the kit bag of national power. The twentieth century paradigm of international order seeks stability as a basic condition so that sovereign

states can govern the territory and populations within their legal purview. But as Kavalski indicates, the tendency to identify patterns or regularities in the social sciences fools people into thinking instability is the abnormal condition when in fact it is the norm.<sup>137</sup> The conceptual error lies in the habit of viewing the international system through the paradigm of the state, which means all the changes occurring within the state's boundaries all the time tend to be overlooked. Oftentimes SOF are seen as the tools for creating stability through their FID mission which primarily aids in breaking the networks threatening the perceived stability.

It is hard to cognitively describe, but there is a flow to social systems from the Complex Adaptive Systems perspective, and it does not neatly square with the concept of "stability" typically presumed to be the norm in society.<sup>138</sup> That flow is expressed in the concept of emergence, and it is one of the core concepts challenging the idea of scientific prediction. Remember first that Reductionist approaches argue that prediction is possible if all the variables are known. In contrast, the concept of emergence asserts that some systems take on qualities and behaviors that cannot be predicted even with perfect knowledge of the variables constituting the system—the blending of building blocks yields a completely novel and distinct level of existence beyond the blocks comprising it. The clearest example of the idea of emergence is the human being.<sup>139</sup> The building blocks of each human being consist of oxygen, hydrogen, carbon, nitrogen, and an assortment of other natural minerals. Yet when blended together they create an emergent existence with cognition, intention, agency, feelings—indeed, life—beyond the base building blocks. While the chemistry can be explained, the way each person acts is an emergent existence.

Social interactions and interrelationships often take on emergent qualities and cannot be predicted. As an early advocate noted, "Novelty is inherently incapable of being foretold,"<sup>140</sup> and may be "scientifically interpreted and apprehended, but only after it has occurred."<sup>141</sup> In terms of the scientific method, strategic surprise occurs because the models of social interaction cannot account for emergent phenomena because they never happened before, so it was not even known such phenomena should be modeled in the first place. This is the essence of the Black Swan event made popular by Nassim Taleb. In retrospect, modelers can assemble the variables to show the model was capable of accounting for the emergence, which leads to the often errant thought that explaining the emergence of the recent past now enables

the future to be predicted yet again. When appreciated in the context of open systems and the limits to perfect information, the notion of emergence as a philosophical matter is instructive for SOF problem sets. Indeed, even some advocates of Reductionism assert that concepts of emergence make sense in light of “incompleteness of current theories, limits on computational ability, or limitations on our cognitive capacity.”<sup>142</sup>

To get a better sense of why emergence is possible, focus for a moment on how a single system is constituted according to the Complex Adaptive Systems perspective. There are four components: (1) the building blocks that exist in the environment (people as agents), (2) groupings of building blocks, called varieties (dubbed here organizations as agents), (3) constraints on the varieties (structures), and (4) a system mapping, which occurs when varieties (organizations) comprehend their environments and constraints and transmit the mapping as information. Mapping is the most important aspect because it is what enables agents (varieties) to intentionally act upon and change their structures (constraints) through new and novel relationships.<sup>143</sup> This is the agent-structure debate (chicken or the egg) mentioned earlier in chapter 2.

According to the Complex Adaptive Systems perspective, the illusion of stability—or regularity—in the social realm results from the constraints. Strong constraints on behavior reproduce themselves over time and take on the properties of “culture.” Cultural constraints make sense in the time and environment in which they are created, but they do not remain static over time; they morph to adapt to changes in the environment.<sup>144</sup> Tensions always arise within and among the subsystems—people want more material goods, need to protect spiritual artifacts, have to respond to changes in the environment, etc. This feedback loop does not lead to equilibrium—that only happens in closed systems.<sup>145</sup> Rather, in open systems, there is a tendency towards homeostasis, a concept developed “to avoid the connotations of equilibrium, and to bring out the dynamic, processual, potential-maintaining properties of basically unstable physiological systems.”<sup>146</sup> In this view, systemic relationships and interactions tend to form relatively stable structures, but only for a period of time, and as the environment introduces new tensions, the old relationships and interactions become brittle or give way to new, more successful innovations.<sup>147</sup>

The concept of homeostasis was further elaborated upon for the sociocultural realm to “express not only the structure-maintaining feature, but also

the structure-elaborating and changing feature of the inherently unstable system.”<sup>148</sup> Complex Adaptive Systems scholars use the term morphogenesis to relay the idea that to maintain a steady state, a system might have to allow for changes in the underlying structures. This is profound and generally uncomfortable when interpreted through the Western, stability-oriented mindset. Buckley summarizes,

Thus, the complex, adaptive system as a continuing entity is not to be confused with the structure which that system may manifest at any time. Making this distinction allows us to state a fundamental principle of open, adaptive systems: Persistence or continuity of an adaptive system may require, as a necessary condition, change in its structure, the degree of change being a complex function of the internal state of the system, the state of its relevant environment, and the nature of the interchange between the two. Thus, animal species develop and persist or are continuously transformed (or become extinct) in terms of a change (or failure to change) of structure—sometimes extremely slow, sometimes very rapid.<sup>149</sup>

The morphogenesis concept creates the cognitive possibility for the appearance of social stability despite the fact that the building blocks of society are in constant flux—and necessarily so as they respond to internal and environmental challenges. Certain structural constraints seem durable, perhaps permanent, and are reinforced by hierarchies of authority<sup>150</sup> that maintain the “essential variables” delimiting the cultural constraints from others.<sup>151</sup> Remember for a moment the concept of path dependence from chapter 1; people tend to recreate their family habits, commutes to work, job functions, etc. every day because “the way things are done” get “locked in” their minds, hence the appearance of stability.<sup>152</sup> Nevertheless, systems and subsystems constantly emerge from an unending process of structuring, destructuring, and restructuring,<sup>153</sup> and those systems that fail to adapt or proactively prevent it are the ones that collapse catastrophically “by way of internal upheaval of ineffectiveness against external challenge.”<sup>154</sup>

## **Pixels, Patterns, and Pictures**

The terms “emergence” and “morphogenesis” are hard to remember and probably not the best way to think about the basics of complexity theory.

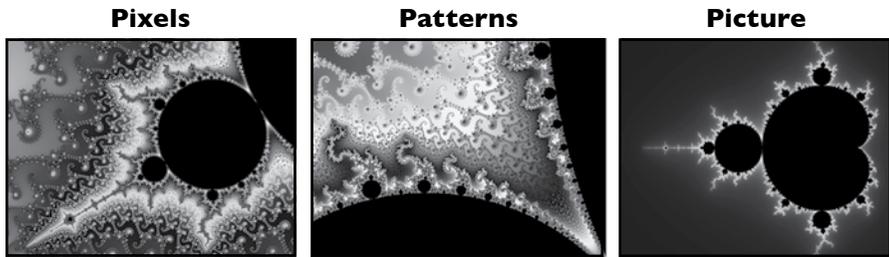


Figure 10. **Morphogenesis in action.** These images are examples of a Mandelbrot set from the micro level (left) to a macro level (right). Mandelbrot sets derive from simple mathematical rules to create complex, continuously changing visual images. While this image was originally a single, large, black dot, the formula produced self-replicating rules forcing internal changes that collapsed the original structure over time to generate the mutated images above. Changes occur internally at the margins, just like in states, but over time have significant impacts on the Picture's behavior and appearance. Focusing only on the Picture misses the dynamism occurring among the Pixels! PHOTOS BY WIKIMEDIA COMMONS/ WOLFGANG BEYER/CC BY-SA 3.0

Instead, think about something everyone knows about, digital pictures. The most basic element of a digital picture is a pixel, which can be any color in the rainbow. A pixel by itself is static, motionless, and meaningless. When it is placed next to others, a pixel begins to form a pattern, but only because it stands in a relationship with other pixels (see fig. 10).<sup>155</sup> Digital pictures typically have numerous patterns that together form coherent image, meaning, and substance. In the morphogenesis concept, people are the pixels. The regularities that people create—and that social scientists love to quantitatively measure—form the patterns and social structures. All the patterns combine to form the picture. Introduce new pixels, perhaps by using photo manipulation software, and the overall meaning of the picture might change. The same is true of society which is always changing due to deaths, births, new technologies, and new ideologies among other factors.

Pause a moment now and think back to the collapse of the Soviet Union and the Arab Spring. Strategic surprise occurred in both cases because the patterns of social interaction at the government-to-government or state-to-state level continued with relative predictability—they were regularities in the fullest sense of the term. Appreciating the context from only the state-centric paradigm obscured the realignment of social forces at the lowest levels. Morphogenesis occurred at the pixel level for years and only when

the structural constraints gave way did the new form of things suddenly become manifest. Strategic surprise was not the result of an inability to sense things on the ground; rather, it was the result of whether such things mattered and should have been sensed in the first place! When precipitating events occurred—the attempted coup against Gorbachev in the Soviet Union and the self-immolation of a street vendor in Tunisia, respectively—no one truly knew the system interactions that would unfold. Frankly, they simply emerged as the pixels (movement leaders) and structures adapted to events in real time.

### **The Desired Future and the Limits of End States**

For military professionals emergence and morphogenesis have some profound implications. First, as an institution designed to kill people and break things, the military is best suited to destroying structures (constraints) and opening up the system to new, novel interactions by agents—this could be good, such as destroying Nazism in Germany, or bad, such as creating the space in Libya for jihadi Islamists to propagate. Which way it goes depends entirely on the alignment of the pixels and patterns (people and the organizations they form) along with their systems of interaction and resourcing. Second, it is far easier to think in terms of end states when the objective is destroying structures and moving forces along an axis of advance than when the objective is to build government and governance over the medium-to-long term. Neither is linear in actuality, but the former is more puzzle-like and tactically of shorter duration than the latter, which unleashes all the worst elements of wicked problems. Third, SOF missions, such as CA, MISO, FID, UW, and BPC all are conceptually oriented around the pixels and patterns (people and organizations as agents) and intrinsically impact the systemic interactions at the subnational level. Everything SOF does has a systemic impact downward as well as outward. And fourth, even with the most elegant Intelligence, Surveillance, and Reconnaissance (ISR) or the best placed human informants, predicting end states for wicked problems is still a bridge too far for any military force.

The assertion that variables, factors, and influencers contributing to a future time, place, and condition are causally knowable and controllable in an open system under conflict conditions is consequently false, especially over time. In a complex world system where the human domain dominates,

it is a common fallacy to believe one can be empowered by computers, Big Data trend analysis, algorithmic modeling, and the scientific method to causally predict future systems and their behaviors. Again, this is not to say that modeling and trend analytics have no utility—they do, but here time and scale of the patterns become crucial limiting factors. It is only to highlight the cognitive problem to which one might fall prey—Americans expect and look for stable patterns of interaction and believe they can engage in social engineering to restore structures based on a linear planning process, such as JPP and MDMP. A Complex Adaptive Systems perspective makes such an expectation more circumspect and realistic. Kiel observes:

The static nature of linear and deterministic models reveals that these efforts provide at best a ‘snapshot’ of reality with, most likely, only short-term relevance. The determinism generally embedded in traditional linear models inhibits dynamics that may arise over time. This can result in naïve extrapolation based on assumptions of static relationships between relevant variables ... This understanding thus suggests a rethinking of the purposes of forecasting. Research in nonlinear dynamics reveals that it is possible to predict the onset of chaos in nonlinear systems (Baumol and Benhabib, 1989). Perhaps, a more prudent approach to forecasting then should focus on forecasting ‘symmetry-breaking’ events when existing structures break down generating extreme uncertainty as to structural and behavioral outcomes. Rather than attempting to identify specific outcomes based on ‘stable’ projections in nonlinear systems, a more appropriate focus for forecasting may concern the onset of structural disintegration (Loye and Eisler, 1987).<sup>156</sup>

For SOF, Kiel’s suggestion turns on its head the traditional American desire to determine patterns of behavior and to reinforce stability. Instead of asking “How do we achieve stability?” he suggests asking, “What might change the way the system’s pixels interact and cause a break in current patterns?” The stability-based question orients the mind to the high level structural design of authority (military and police) and does not necessarily require any effective knowledge about the society’s population or culture. In fact, it only really requires a paradigm of states and government—it is about power and organization. The systems-based question, on the other hand, first requires a deep appreciation of society’s agents (populations and

organizations), their norms of interaction, worldviews, structural constraints, and some sense of the social tensions driving innovation in their behavior. Only then can the currents of politics be navigated. The systems-based question could be used to determine U.S. and allied influence operations or to determine how enemies might seek to exploit socio-political vulnerabilities. Indeed, the systems-based question is the very essence of the Gray Zone, hybrid conflicts, or conflicts short of war.

Consider Joint Doctrine in this context for a moment. JP 5-0 clearly states it is just a guide, but the reality in practice—albeit subconsciously—is that U.S. military culture, training, and experience have ingrained a desire and belief in controlling variables to effect the COG.<sup>157</sup> It leads to the attitude, “If I plan artfully enough, I can achieve my desired end state as precisely as I’ve envisioned it.” This is fraught with danger because it encourages a war of “chasing the MOE” to prove a concept with an intrinsically short-term perspective and, very often, one that is not a reflection of local reality but of American cultural paradigms. In short, planning an end state and focusing on it as the objective presents a cognitive and attitudinal trap as General McChrystal demonstrated in his question to his forward-deployed forces.

## Range of Possible Futures

The Complex Adaptive Systems orientation leads to a different way of looking at things, and the SDW offers an alternative perspective in that it considers a *Range of Possible Futures* instead of an end state (see fig. 11). The range of possible futures feature of SDW accepts that the future is indeterminate and not predictable beyond a high level of generalization. There is a starting point—the current context—with agents, structures, constraints, patterns, trends, etc., but, like a cone of uncertainty used with predicting hurricane tracks, the range of possible futures recognizes that morphogenesis inevitably leads to changes in the variables over time, rendering reductionist, linear, time

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*As with scenario planning, the range of possible futures engages in a series of appreciations exploring possible tracks based on hypothetical changes in agents and structures.*

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constrained COG analysis susceptible to error over time. As with scenario planning, the range of possible futures engages in a series of appreciations exploring possible tracks based on hypothetical changes in agents and structures. One scenario

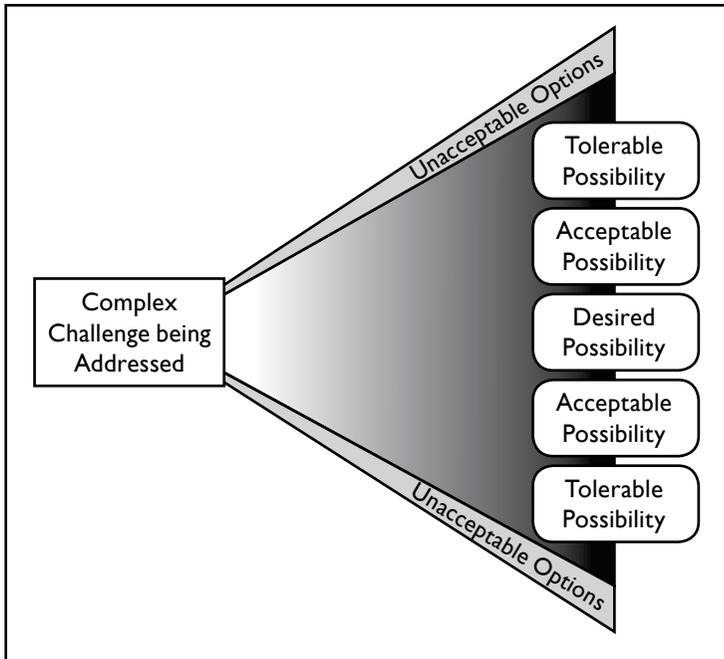


Figure 11. The Range of Acceptable Futures model.

is typically most favorable, and this is the desired future. It bears much in common with the intent of an end state in that it is the future seen as most beneficial. The key difference is that the SDW acknowledges limits on the ability to control the direction of future events and is consequently less concerned about the plan itself. Futures in the SDW are a matter of asking how the system is being influenced and how the system might be altered—if at all possible—to put a trend moving away from the desired future back on track. Unsurprisingly, the SDW stresses continuously updating appreciations of the context to determine how interventions and activities have impacted behavior in and among the systems in a perpetual, iterative process—as mentioned before, once is never enough!

Return again for a moment to the collapse of the Soviet Union. U.S. containment policy was predicated on the idea that internal contradictions in the Soviet Union would ultimately cause its demise, and the United States' strategic objective was to deny the Soviet Union the outlets to overcome those contradictions. The desired future was the eventual elimination of the Soviet Union as a geostrategic and existential threat without the specificity and

backward planning normally associated with an end state. How the U.S. got to that point was anything but linear and included communist victories in Vietnam and Central America, détente with China, and an American technological revolution among other things. It was impossible in 1947 to predict how the Soviet Union's collapse would unfold in 1991; in fact, most analysts were surprised it fell apart at all. But, the desired future guided U.S. grand strategy and oriented statecraft toward a guiding light with adaptations and innovations along the way. Similarly, rather than focus on prediction, the SDW considers the possible emergent conditions influenced by known and unknown variables. As Taleb argues, life becomes simpler if one focuses on possible emergence in the system and its consequences instead of expending resources trying to predict the unpredictable.<sup>158</sup>

It might be apparent from this discussion that SDW requires a slightly different approach to logic and forecasting. Although the military spends an enormous amount of time trying to use history to predict future system behavior, the past does not predict the future though history can be instructive. The two main approaches to inference underlying the mainstream scientific method, the deductive and inductive approaches, assume the past can predict the future, but in different ways. Sherlock Holmes represents the master of the deductive approach. His "Elementary, my dear Watson," approach starts with a logical conclusion and works backward to show how elements or variables fit as evidence along the logic chain. In the deductive approach, variables are logically presumed to have a causal impact or correlation with an outcome (usually based on some prior experience), and mainstream statistical testing then determines whether the presumption holds. Viagra represents the most notable recent case of the inductive approach through which testing reveals patterns, correlations, or causation without any prior notion of cause and effect. Pfizer scientists deduced based on experience the drug's core ingredients would treat high blood pressure and coronary heart disease. Large scale clinical trials revealed the drug had no effect on heart issues, but male patients did report an interesting and well known side effect. The correlation from the original inductive analysis caused the scientists to deduce anew, and they conducted a further large scale clinical trial with the intent of focusing on Viagra's newly discovered recreational purpose.<sup>159</sup> The rest is history.

However, the morphogenesis concept of open systems illustrates that the variables of the past will not be the same variables of the future. There are,

therefore, limits to the value of deductive and inductive inference in open systems. This is not to say that inferences about a population's future interests and behaviors cannot be derived—it is possible to do so since structural constraints do create path dependencies and even open systems generate seemingly stable patterns that endure for some period of time.<sup>160</sup> The main point here is that unqualified application of prediction or predictive processes fool us into thinking the system can be controlled to achieve an end state when in reality the best to actually hope for is arriving at a new, ambiguous, future beginning.<sup>161</sup> Even the greatest physicist today would caveat that any prediction is based on a conditional assessment due to the framing of the starting conditions.<sup>162</sup> The use of history is in reality interpretative and has limits. However, history does help provide deeper insight into human decision making when confronted with particular problems if appreciated in the context of the time. Cultural constraints matter in creating path dependencies and patterns of behavior, but how a population interprets its history changes over time. John Lewis Gaddis, a renowned historian, says the “problem with the future is that it is so much less knowable than the past.”<sup>163</sup> Nevertheless, ancient history and the far future share common traits—each are opaque and avoid clear, consistent and agreed upon interpretations.

In essence, prediction or forecasting in open social systems is more akin to conjecture based on informed judgment.<sup>164</sup> Instead of logical deduction or induction, scenario planning the range of possible futures employs something called abductive inference or creative abduction. Khisty explains:

While trend extrapolation is based on inductive inference, and theoretical forecasting is based on deductive logic, informed judgment refers to knowledge based on experience, intuition, and insight. Informed judgments are often based on abductive inference, that is, the process of reasoning that begins with claims about the future *and then works backwards to the information and assumption necessary to support claims*. However, inductive, deductive, and abductive inferences are never completely separable in practice.<sup>165</sup>

Unlike deduction, which looks backward in time at logic and historical experience, creative abduction makes claims about possible futures and explores what new agents, structures, systemic interactions, etc. will have to occur in order to arrive at the possible future.<sup>166</sup> Doing so for each possible scenario creates some of the Indications and Warning necessary to determine

where the system is trending in the cone of uncertainty, which can also demonstrate flaws in the existing appreciation of the context.

Everyone uses creative abduction in their lives. For example, most high school graduates recognize that they want a higher wage than they can achieve with the knowledge and skills earned to receive their diplomas. Many will decide to pursue a college education and one might decide, for instance, to become a renowned surgeon. To be a renowned surgeon stereotypically requires many steps, which is where the creative abduction comes in. One might think the path to acclaim requires a residency at a particular hospital, which requires a degree from one of three potential universities, which require certain grades and extracurricular activities, etc. While the student relies on her logic (and even perhaps even some empirical evidence from friends), it is her claim about the desired future that sets her behaviors in motion. One might ultimately fail in their bid to be a renowned surgeon, but might find they are a phenomenal medical instructor.

Creative abduction already has some application in the history of the SOF enterprise. Consider the initial preliminary military actions in Afghanistan following the horrific 9/11 attacks on the homeland. There was no existing plan given that the contemporary appreciation of the strategic landscape dismissed the Taliban-controlled country as a major threat. It therefore followed that no standing contingency plan or plans for invading Afghanistan had been developed. The U.S. military was blind to the notion that it might have a national security requirement beyond missile strikes wherein real military intervention in Central Asia would be a possible future. However, in short order, without a specific operations plan (OPLAN) fully developed, SOF rapidly and successfully executed effective military operations that directly led to the near term denial of Afghanistan as a safe haven to al-Qaeda and enabled the collapse of supporting Taliban government and influence. The desired future as outlined by the Bush administration was achieved without years of operational planning on the way in which it might be attained. However, once the concept of operations was developed, JPP and MDMP proved to be valuable tools as SOF destroyed Taliban and al-Qaeda structures. It has been the nation building effort, with all its wicked problems, that has stymied the U.S. and allied forces and allowed the Taliban to emerge in the system again.

## Think like a Great Explorer

To best imagine the desired future, consider this view. Think of a great explorer—perhaps Columbus—preparing to embark on a voyage to discover a new route to India. He studied and considered the possible problems, planned for stores, recruited a crew, and produced a raw estimate on how to head West between the Atlantic’s latitudes to make the most of its prevailing wind patterns. Remember at that time there was no means to pinpoint one’s location longitudinally on the earth’s surface. Therefore, time could seem to stand still on windless days on the open ocean. Based on the extraordinary constraints on knowledge, Columbus, like his predecessors and the many that followed, embraced what the SDW refers to as the range of possible futures.

The great explorers did not have the crutch of a 200-page, detailed OPLAN with supporting annexes to outline a “Schlieffen-like”<sup>167</sup> approach to a clearly defined end state. Great explorers recognized their lack of control over the larger world, yet sailed into the unknown expecting to change course and speed often. Whether Columbus made landfall in India, Nova Scotia, or the Caribbean, he would have been successful. Missing land and sailing deeper into an infinite ocean would have been unfavorable. Moreover, he like the other great explorers continually appreciated the current context and navigated toward favorable outcomes. The great explorers adjusted for wind, current, and the human domain comprised of mutinous behavior from their crews. The divergent thinking to fully consider the range of possible futures is analogous to great explorers.

When considering the range of possible futures, it is helpful to think about what might emerge with or without intervention in the system. Explore the current context to identify and learn about various system drivers and reflect on or question the assumptions made about the direction and speed of systemic change. Is the system stable with slow change or turbulent with rapid change? If no interventions are made, how is the system trending, and how might it behave in the future? What is the future related to U.S. interests? Consider also bounding possible futures as either near or far futures, with both scaled or defined by the context of the issues at hand. In a COIN environment, for instance, tactically the near future might be a period of darkness as compared to a far future characterized by a dedicated effort to introduce new actors and systemic interactions that might take several

years. The further the future is desired, the greater the chance for disparity or variance among the range of possible futures. Again, the SDW focuses on possible not just “Likely” futures at this point. After exhausting efforts to identify the range of possible futures, the SDW then determines which of the possible futures will be favorable to SOF objectives.

Certainly fostering a future oriented mindset is useful and necessary to align resources and activities toward a desired goal. The real question is whether it is possible to predict the future. Taleb refers to the American proclivity for prediction as a “teleological fallacy,” the illusion that people know exactly where they are going or that they know where they were in the past.<sup>168</sup> The SDW builds upon his argument by adding that one does not know how to arrive at a desired future beyond any general sense, though it is comforting and necessary to “have a plan.”

Complexity, emergence, and morphogenesis constitute a messy way to think about SOF operating environments, but as General McChrystal notes, adaptive enemies are the wave of the present. These three concepts go a long way in describing how states are influenced at the lowest levels and how to think about the future in nonlinear terms. As chapter 5 illustrates, states are always in a state of flux, so accepting that stability is a myth is the first step for effectively operating in complex dynamics.

### Key Terms

Desired Future, Emergence, Morphogenesis, Deductive Approach, Inductive Approach, Creative Abduction

### Summary

- The concept of emergence asserts that some systems take on qualities and behaviors that cannot be predicted even with perfect knowledge of the variables constituting the system—the blending of building blocks yields a completely novel and distinct level of existence beyond the blocks comprising it.
- The concept of morphogenesis illustrates that prediction in the social sciences is always conditional because the variables (people) have the ability to intentionally change over time.
- Due to the uncertainty of the future and problems with prediction in the social realm, the SDW adopts the idea of a range of possible

futures with a desired future serving as the optimal trajectory toward which to strive.

- Creative abduction is the approach for navigating toward a desired future because it imagines the interventions in the system that need to occur so that the structures are in place to enable the desired future to manifest.



## Chapter 5. The State of States: The Myth of Stability

### We Think It, Therefore It Is

The previous few chapters together covered concepts that when combined produce an unorthodox perspective of how to view the “state.” What if the state is at its core a paradigm of social organization and authority whose pixels periodically establish self-replicating patterns of political behavior (despite those pixels being in a constant state of change) granted legal recognition by similarly structured entities? Might one think differently about how to view the picture, its various patterns, and the potential of each pixel? This description is not meant to be a definition of the state, just an alternative Appreciation of it as a living, always tenuous social experiment, which stands in contrast with traditional social science conceptions that take it to be an objectively real, legal entity that stands apart from the populations comprising it.<sup>169</sup> Unlike rocks that have intrinsic material and physical properties, states only exist because people purposefully create their institutions,<sup>170</sup> provide them the resources to generate and utilize force, and imbue them with meaningful symbols. Failed states demonstrate this point most dramatically because they cease to exist as states once people deny them the personnel, money, resources, and deference that enable the institutions of state to function.

Just as importantly, the complex adaptive systems perspective suggests that, as a tenuous social experiment, each state’s evolutionary trajectory is in many ways unpredictable over the medium to long term due to open system dynamics and the concept of emergence.<sup>171</sup> For SOF, this is actually liberating in many ways since a number of its core activities relate to non-kinetic, system influencing missions. On the other hand, it means that threat actors, such as ISIS, al-Qaida, Russia, and Iran, also have the capacity to interrupt, undermine, or redirect the way a state’s pixels interact, especially if they keep at it over time.

As noted in chapter 3, a paradigm of the state is meaningful to the extent that it enables people to conceive of and talk about it via common frames of reference, vocabulary, and principles of discovery.<sup>172</sup> Kuhn writes:

Previously, we had principally examined the paradigm's role as a vehicle for scientific theory. *In that role it functions by telling the scientist about the entities that nature does and does not contain and about the ways in which those entities behave.* That information provides a map whose details are elucidated by mature scientific research. And since nature is too complex and varied to be explored at random, that map is as essential as observation and experimentation to science's continuing development [emphasis added].<sup>173</sup>

States are real, they exist, and are agents that have contributed to both extraordinary good and evil in human history. The paradigm of the state

*The paradigm of the state is therefore important, but as Kuhn warns, potentially blinding to other social factors.*

is therefore important, but as Kuhn warns, potentially blinding to other social factors. For the U.S. military, the paradigm of the state prompted the creation of intelligence tools like DIMEFIL and PMESII-PT<sup>174</sup> which are meant to capture states' centers of power and weakness. In other words, the paradigm

of the "state" is what makes the DIMEFIL, PMESII-PT, and the Failed State Index meaningful tools in the first place.<sup>175</sup>

But, as illustrated by the pixels, patterns, and pictures discussion, it is but one paradigm of interaction and authority among people, and it might be a painfully inappropriate primary frame in many parts of the world. In an era of conditional sovereignty and fragile or failing states, it is perhaps better to appreciate the context from the perspective of how local actors are specifically encouraging morphogenesis in their societies over time. States only have agency to the extent their sub-units empower officials to carry out government services on their behalf, people identify with the state and its institutions, and/or the state can assert its will despite resistance from below.<sup>176</sup> As changes in the environment and amongst the population and their interactions occur, so do the opportunities, constraints, and vulnerabilities for the state. It is important to remember that states are a recent human innovation whose evolution requires some context.

## Call it 70-ish Years

As all good students of international relations will definitively answer, the modern state system stems from the Peace of Westphalia in 1648 which

concluded the devastating 30 Years War in Europe. Westphalia established the main principles of inter-state relations, particularly regarding sovereignty, diplomacy, and warfare. It took another 200 years for the rest of the world to fall subject to the state system, most notably through the vehicle of colonial imperialism. While Americans are quick to think of imperialism as a thing of the ancient past, the truth is that there are still hundreds of people still alive today who, though centenarians, lived during the Ottoman, British, Russian, French, Dutch, and Portuguese Empires; Spanish imperial holdings were largely seized by the United States in the Spanish-American War over a decade prior. Together, these empires controlled the vast majority of the world's territory and populations either directly or through weak proxies. Only in the 1950s and 1960s did these empires really begin to lose control of their decades-to-centuries-long domination.

The world Americans take to be objectively real, comprised of supposed nation-states, rooted in the rule of international law guaranteeing their sovereignty, the inviolability of their borders, the primacy of their national governments to administer to their own populations, and the non-use of force between them, is only about 70-ish years old, and even then there were only about 51 countries in existence when the principles were enshrined by the United Nations in 1945. In other words, the majority of the world's recognized 193 states are just over sixty years old!<sup>177</sup> While many people take the paradigm of the "state" to be an objective reality, for the majority of the world's population, it is a relatively recent phenomenon.

While the nation-state system is relatively young for the majority of the world's population, the systems of governance predating colonial domination are ancient and their residue persists in important ways; they oftentimes just do not conform to the image of nation-state centric government Americans and other Westerners take for granted. The theory of international law regulating interstate relationships assumes that war can be eliminated between states if legitimate state governments administering to their self-identifying nations are given the space to do so without the threat of interference from external forces. It is a balancing act focusing on a physics-based, reductionist equilibrium among states requiring equilibrium within states.

From the foreign policy perspective—where the U.S. military comes in—the key is to deter malign actors from destabilizing the equilibrium among states. It is a top-down perspective that concentrates attention on the paradigm of the state while fictionally separating governments' behaviors from

the populations that comprise them.<sup>178</sup> Or, perhaps most dangerously, this paradigm highlights the preservation of allied governments while diminishing the relevance of the internal social tensions among the pixels and patterns, interactions that give rise to state behavior in the first place.<sup>179</sup>

The Complex Adaptive Systems perspective asserts that a more productive view of the state is as a “complex ensemble of competing forces which offer unequal chances to groups within and outside the state to act for differing political purposes.”<sup>180</sup> The morphogenesis concept holds that individuals’ expectations of or desire for a better life propel them to seek new relationships and technologies to improve their positions.<sup>181</sup> They will continuously innovate as a result, sometimes with negative results (imprisonment, poverty, or death) and sometimes with positive ones (power, riches, or revolution).<sup>182</sup> A state in this new paradigm is “only a relative stability of underlying, ongoing micro-processes. Only when we focus on these can we begin to get at the selection process whereby certain interactive relationships become relatively and temporarily stabilized into social and cultural structures.”<sup>183</sup>

While the traditional paradigm of the state taught from middle school through the graduate level reinforces the state as an objective, measurable, linear evolutionary entity, the appreciation from the complexity perspective takes it to be a subjective, constantly adapting, nonlinear, conditional system of systems. The weaker the central control in a state, the greater the chance for innovation, and positive feedback loops create the potential for rapid, unpredictable change.<sup>184</sup> Whereas traditional concepts of foreign policy seek to make states relatively homogenous entities, the Complex Adaptive Systems perspective suggests that this is not really possible. Emergent systems result from heterogeneity and the initial starting conditions lead to radically different pixels, patterns, and pictures—the formula for stability in one state will not likely work in another!<sup>185</sup> The authors hope that chapters 5 and 6 provide a learning path that leads to a new appreciation of the context of the state while providing both an example of the SDW’s utility and a more fruitful way of perceiving the environment in which SOF operate.

## **The State Viewed from Below**

The paradigms of the state and state system pervasive in the American education system consequently create extraordinary blinders across the USG, but significantly hamper how SOF currently interpret their mission. As noted

previously, a good portion of SOF core activities are actually oriented toward the process of morphogenesis (influencing the pixels and patterns), but the DA and FID missions underlying the SOF identity in the CT and counter-network wars direct the enterprise's attention overwhelmingly toward state governments. How many intelligence and training resources actually enable or require SOF to learn deeply about various populations' worldviews at the meso- and macro-levels, how they live their lives, and what they view as legitimate governance norms and values as opposed to how the government operates? Aside from basic language and etiquette courses for SOF and strong efforts to understand dynamics affecting partnered units, there are few. Yet the complexity perspective demonstrates that local context is the single most important factor in emergent systems.<sup>186</sup>

If a state is a system of systems,<sup>187</sup> each comprised of individuals struggling for a better allocation of resources and influence, then it is crucial to also take a view of states from the bottom up. Westerners are raised to believe that all organizations, whether commercial or governmental, are supposed to operate on the basis of rationality, merit, and fairness. Beyond this, Ruth Lane argues that "mainstream analysts frequently define the state in idealistic terms, as perhaps the manifestation of the people's sovereignty, or as the guarantor of its citizens' rights, liberties, and freedoms. The standard top-down viewpoint, in other words, is entirely idealistic, announcing what the speaker thinks the state should be rather than what it is."<sup>188</sup> But, as Lane points out, "institutions will favor some groups in society, fairly or unfairly; and institutions will damage other groups, because institutions are the result not just of civil negotiations, as the sociologists tend to label them, but also of coercion and everyday acts of war."<sup>189</sup>

Unfortunately, the most basic assumption of the nation-state—that the government is the legitimate representative of its population—is from a Complex Adaptive Systems perspective problematic, always conditional, and potentially a significant cognitive blinder. Even if race, religion, ethnicity, and other such identity markers are removed from the equation, complexity analysis concludes that tensions inevitably arise even within homogenous populations. Like-minded and similarly interested individuals are attracted to one another (homophily) and, to the extent they can easily interact (propinquity), create patterns, regularities, or institutions to pursue their collective ends. As systems of relationships, states have properties of "emergent social networks [which] are based on particularistic principles.

To the extent that friendship, homophily, and propinquity play roles, these networks are fundamentally ‘unfair.’<sup>190</sup> Innovative self-organization is a feature of all institutions and inherently the stuff of politics, “where it fills empty areas in which there are no official rules or procedures, and indeed sometimes it works against the official rules, in ways quite contradictory to the legal framework.”<sup>191</sup>

Viewed from below, the state is, as Buckley summarizes, “the systemic *matrix* of interacting, goal-seeking, deciding individuals and subgroups—whether this matrix is part of a formal organization or only a loose collectivity ... And it is important to recognize that out of this matrix is generated, not only social structure, but also personality structure, and meaning structure.”<sup>192</sup> The matrix could include civil society, the government, the media, ISIS, narco-traffickers, ideological revolutionaries, or keepers of the faith. Colanders and Kupers succinctly explain why the state stands apart:

While government is just another institution in a complex system, it is a very special kind of institution since it has been imbued with a particular property, namely it has significant power to influence the very rules that determine the emergent dynamics of the whole system ... The government is an institution to which agents have delegated the power to influence the interactions between themselves.<sup>193</sup>

The difficulty for SOF operating within a USG that understandably privileges state-to-state interactions above all others is that the paradigm of the state make it hard to appreciate how smaller subsystems operate within a state and affect the larger system of states.<sup>194</sup> The state is the first among equals, but it is not an end in and of itself.

## **The Myth of Stability**

So many of our foreign policy discussions nowadays revolve around how to stabilize the international system or return to a stable international order (with the U.S. at the top). The intrinsic assumption is that the pixels of society, whether internal to states or among the society of states, can be balanced to achieve perpetual equilibrium. If a pixel moves out of place and upsets the equilibrium, then an intervention can put it back and restore the balance. Viewed from this perspective, there are right and wrong balances in the system’s patterns. Subconsciously a closed system approach to the world is

adopted; the challenge is to restore the variables in the equation back to the correct mix (a little governance here, a little more economic development there) to achieve a stabilizing effect among states. Rather than an emergent flow of subsystem interactions that evolve over time, there is a formulaic, cause and effect undertone to the stability mindset.

SOF are therefore confronted with a paradox as a consequence of the idea of the nation-state. Stability among states was predicated on the assumption that war could be avoided by creating states with hard boundaries within which self-governing populations would achieve internal equilibrium and, hence, international equilibrium. Complex Adaptive Systems theory and emergence suggest that this notion of stability is a myth, and the rigid structures put into place to secure states actually make them more susceptible to catastrophic failure when their societies engage in destructuring faster than their states can adapt. As Wight notes, "There is never a point when the state project is completed within a given territory and thereafter operates according to its own fixed and inevitable logic."<sup>195</sup>

From a SOF perspective, viewing states and societies as fluid systems of systems opens a world of opportunity to prompt emergence. In fact, the special warfare side of the core activities intrinsically operates with this perspective in mind. Social network theorist Charles Kadushin explains that informal, emergent networks will always arise to challenge the stable order because formal structures can never address all sociopolitical contingencies, which leaves space for new networks of influence to develop, new leaders to appear from below, and new relationships of interest or community to form.<sup>196</sup> It is not hard to imagine how terrorists, narco-traffickers, revolutionaries, resource warlords, and others fit into this explanation when the state is deemed illegitimate by the local population or is simply nonexistent. From this framing, the systems comprising a state coevolve over time, with pixels and patterns endlessly competing for advantage over one another, and the government only influences their interactions and cannot fully control the system of systems.<sup>197</sup>

In contrast to the equilibrium view of states, complexity theory adopts of the concept of basins of attraction. Keeping with the fluid- and flow-oriented themes of complexity, these basins of attraction generate many quasi-stable leveling points instead of a single equilibrium balance. The basins fill as cracks in the system generate the space for innovators to flow, and when the flows experience positive feedback, the basins continue to fill, sometimes

rapidly.<sup>198</sup> Complexity theorists note that flows can reach a tipping point when the trend, idea, interest, or behavior becomes self-replicating and self-sustaining<sup>199</sup>—that is, it becomes the “new normal.” But Colanders and Kupers warn that the idea of the tipping point actually misses the point: “The term is unfortunate, as it unduly emphasizes the point when change suddenly appears. In fact, as Gladwell explains, the real action happens long before the shift, when a head of steam builds up inside the system. While the Arab Spring seemed to erupt suddenly, it actually was the result of a long buildup of social tension. To the observer the tipping point looks like a point at which a relatively small event led the system to an alternative basin of attraction, but in fact the small event was simply the straw that broke the camel’s back.”<sup>200</sup>

Stability is a myth in international politics because the units are constantly being reconstituted as new basins of attraction alter the relationships in society. With morphogenesis forever altering (albeit, perhaps, very gradually) the picture of the state by rearranging the pixels and patterns, change not stability ought to be the expectation with the analysis looking toward how the subsystems of states interact to create new relations of influence. Importantly, the basins of attraction view of society and states highlights an often overlooked aspect of states. While the Western mind is constantly fixated on the society-building aspects of the state, the state can also have corrosive and dissipative impacts on the pixels and patterns of society.<sup>201</sup> Whether a state promotes centripetal or centrifugal basins of attraction depends on how its populations view its legitimacy. The C3 policing vignette illustrates how the state can promote centripetal effects even in the direst of circumstances using SOF principles to create new basins of attraction over time. The blinder imposed by the state paradigm is that the concept of international legitimacy is a different beast than domestic political legitimacy, and it is to this issue that chapter 6 turns.

## Key Terms

Basins of Attraction

## Summary

- While the traditional paradigm of the state asserts it to be an objective, measurable, linear evolutionary entity, the appreciation from the Complex Adaptive Systems perspective takes it to be a subjective, constantly adapting, nonlinear, conditional system of systems.

- There is never a point at which a state becomes a certainty, it is always a work in progress and can come undone depending on internal and external systemic tensions.
- Stability is a myth in the social realm because emergence and morphogenesis constantly introduce new tensions in a society.
- In Complex Adaptive Systems theory, basins of attraction replace stability and equilibrium as the fundamental nature of the system with popular support flowing to the attractors that offer the best solutions to popular needs.

### **Vignette: C3 Policing in Springfield, MA as a New Basin of Attraction**

In 2011, gangs ruled some of the streets of the North End in Springfield, MA. Some even brazenly rode four-wheelers with AK-47s strapped to their backs. Crime was rampant, residents were scared, and the police had few, if any, meaningful relationships with the community. Trooper Michael Cutone of the Massachusetts State Police and a Master Sergeant in the U.S. Special Forces Reserve with 30 years of SOF experience joined forces with the Springfield Police Department to attack the root causes of lawlessness in the North End. Drawing upon his COIN experience outside Tal Afar, Iraq in 2005, Trooper Cutone initiated Counter Criminal Continuum (C3) policing in the North End.



Sgt. Brian Beliveau, left, and State Trooper Jon Blanchard listen as Sheri Kurtz, clinical director for Tapestry Health's LaVoz Program, talks about the South End. Beliveau and Blanchard are part of the newly expanded C-3 unit assigned to the South End. PHOTO BY SPRINGFIELD POLICE DEPARTMENT

Instead of tackling crime through traditional policing paradigms, C3 policing personnel “facilitate unity of effort and criminal intelligence



Community members from Springfield, Massachusetts, attend a meeting on the C-3 Policing Initiative. A core aspect of the program is community involvement. PHOTO BY SPRINGFIELD POLICE DEPARTMENT

gathering by, with, and through interagency, community, and private enterprise cooperation in order to detect, disrupt, degrade, and dismantle criminal activity.”<sup>202</sup> The essence of the initiative is promoting relationships to enable bottom-up solutions to connect with governmental resources. C3 personnel are selected, trained, and incentivized to build relationships with residents and local social service providers. To this end, C3 personnel hold weekly meetings with residents and interested interagency partners to discuss local concerns, air new ideas, and empower the resident pixels to form their own patterns. In other words, C3 policing was designed to create a new basin of attraction to redirect popular flows toward the state instead of settling in the puddles carved out by the gangs.

## Chapter 6. The Nation-State Paradigm and How the Internet Messes Everything Up

Global connectivity gradually undermines national roots and augments or replaces them with a range of transnational bonds and identities. Imagine a world where people are loyal to cities and supply chains rather than nations, value credit cards and digital currency over citizenship, and seek community in cyberspace rather than country. – Parag Khanna, *Connectography*<sup>203</sup>

### What Do We Mean by “Legitimate Government?”

In his classic text *Sovereignty: Organized Hypocrisy*, international relations scholar Stephen Krasner identifies four types of sovereignty all states and their governments seek to achieve. They are:

1. **International Legal Sovereignty.** The legitimate right to govern a territory and population as recognized by the community of states;
2. **Westphalian Sovereignty.** The degree of authority a government can achieve over a territory and population without interference in its affairs by external governments;
3. **Domestic Sovereignty.** The degree of governance a government can achieve to administer to the population and protect its interests within its own borders.
4. **Interdependence Sovereignty.** The degree to which a government can control the flow of people, resources, capital, information, and other factors across its borders.<sup>204</sup>

Legitimacy in the field of international relations is typically oriented upon the tensions between international legal and Westphalian sovereignty. Recognition of a government’s international legal sovereignty is what grants it the legal right to govern and receive overt support from members of the community of states. It is the most basic condition for a government to be

considered legitimate and stands apart from whether it has any element of Westphalian or domestic sovereignty. In this context it is easy to make the distinction between the legitimate government of Somalia, whose writ extends barely into Mogadishu, and the “illegitimate” non-state actors who maintain domestic and interdependence sovereignty over large swaths of the territory and population putatively designated to the “legitimate government.”<sup>205</sup>

Legitimacy in this frame is entirely politically based on the interests of other governments and, therefore, is somewhat arbitrary. It derives from the top-down decision by the community of states—or a few powerful members thereof—that a government meets its standards regardless of whether or not the government is so judged by the population.<sup>206</sup> When there is a disconnect between the legitimate government of a state and its own people, the trick in the Western mind is to enable the legitimate government to perform the functions of the government such that the people grow to view it as organically legitimate. Such is the reductionist, stability-oriented mindset which pervades the USG, most international aid and development organizations, and most Western allies of the United States.

### **International Legitimacy is Different than Popular Legitimacy**

The cause and effect assumption underlying the international legitimacy frame is that a nation-state’s sovereignty is the paramount concern for keeping states from fighting one another. International legitimacy, in this paradigm, is about a recognized government as expressed by foreigners and the desire to bring order, hierarchy, and predictability to complex social interactions within states to simplify and routinize the interactions among states. The non-interference aspect of sovereignty technically means that states should not care at all about the pixels and patterns of others. Obviously, this assumption is false otherwise the Special Warfare aspect of SOF would not exist.

How many U.S. civilian and military personnel repeated from 2002-2017 the trope to Afghan and Iraqi citizens that they were deployed to support the legitimate governments of those countries; how many also knew many Afghans and Iraqis believed their legitimate governments to be illegitimate from their own perspectives? From the international legal sovereignty frame, every single U.S. citizen who uttered the sentiment was truthful.

U.S. personnel brought with them a paradigm of government building upon decades of layered assumptions about legitimacy being based on international recognition; rooted in the material redistribution of society's wealth or international development assistance; about the provision of social services, like healthcare, education, sanitation, and electricity; about the population's right to consent to the power exercised over them;<sup>207</sup> the primacy of central government to harness domestic and international resources to build the economy and institutions of government; and domestic legitimacy being a function of the procedural fairness (democratic process) by which the central government is held accountable.<sup>208</sup>

The U.S. military frame is, consequently, often about authority and power invested in the formal, central government of a state. This is natural since the military is an arm of foreign policy. It is doubly natural since the international relations discipline has reinforced this very perspective for the better part of fifty years. But, when the rubber meets the road it is the U.S. military that must interact with the pixels and patterns of states, and here the inadequacies of the nation-state, government-centric paradigm become unavoidably clear. Sovereign government authority has, assert Earnest and Rosenau, "migrated upward to international and non-governmental institutions and to global corporations; it has migrated downward to local governments, civil society, terrorist cells, and others. Authority therefore is problematic; most of us no longer assume the primacy of the nation-state."<sup>209</sup>

From a Complex Adaptive Systems frame, international legitimacy is an important but severely limited appreciation of the context. Rather, organically legitimate governments grow up from their pixels and patterns to create a stable picture of a state; in other words, states with enduring governments have a positive feedback loop between the agents who create the structures and the structures that influence the new agents over time. Self-replicating political systems demonstrate a "stickiness" in that path dependence reinforces social regularities, especially when the basins of attraction are culturally and institutionally "deep."<sup>210</sup> Stability operations that start with the internationally recognized, legitimate government try to grow down to patterns and pixels regardless of whether they are organized in such a way as to create the desired picture. There is, to continue the metaphor, no depth and little to which the legitimate government can stick.

The paradox of stability-oriented activities from the complexity frame is that, because of the destruction of the social and political structures that

produce patterns and regularities in the population's behavior, there is enormous need, incentive, and opportunity for innovative and emergent behavior

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*Stability operations that start with the internationally recognized, legitimate government try to grow down to patterns and pixels regardless of whether they are organized in such a way as to create the desired picture.*

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as people seek to provide for their families or assert power and influence over resources and populations. As the Cynefin Framework indicates, the desire from the USG perspective is often to impose authority on the chaos or complexity to create some recognizable patterns, but this is costly and difficult to sustain. Authority through police and military force can limit complex socio-political

interactions for a time, but cracks in the basins of authority eventually form and new, more attractive flows inevitably occur. No government's control is ever complete, rather it influences the way agents' interests and interactions emerge for better or worse.<sup>211</sup>

Unsurprisingly, it seems the imperative to establish or reinforce stability has grown more intense just as the range of interconnected systems increasingly undermines the stickiness of the state system. Futurist Parag Khanna summarizes the cognitive problem:

International relations are so preoccupied with threats to sovereignty from the outside, and yet sovereignty is most visibly unraveled from within. Indeed, the growing power and connectivity of provinces and cities are driving devolution in the twenty-first century as significantly as decolonization did in the twentieth century ... Whether mayors or rebels, there are many ways to circumvent the prison of imposed nationhood. Maps of sovereign states thus betray the far fuzzier reality of hundreds of relatively autonomous nodes.<sup>212</sup>

The main issue is that the contemporary world has more potential sites of authority, both legal and moral, than before—legitimacy is not just about the government anymore.<sup>213</sup> People have access to a variety of resources to sustain them when they resist a government's rules, and they often learn how to effectively "game the system" for their own ends.<sup>214</sup> It might very well be the case today that the nation-state centric paradigm promotes system 1 thinking to assert more power and control when the second and third order

effects of such decisions result in worse fissures in some governmental basins of attraction.

Legitimacy in the complexity frame must have a bottom-up component to become sticky and deep. Popular legitimacy—the ultimate socio-political glue or deep basin of attraction—is, therefore, about relational accountability and the degree to which local populations perceive and act upon inequalities and injustices, especially as expressed through the institutions of governmental power. Joy Moncrieffe explains: “Relational approaches are, necessarily, concerned with the processes and power relations that prop up cultures of inequalities. These cultures of inequalities and injustices are not restricted to small communal pockets; instead, they permeate institutional frameworks, such that even the most carefully planned arrangements for checks and balances can carry histories and cultures in ways that warp the desired intent.”<sup>215</sup> From the FID or UW perspective, appreciating how the pixels in a state perceive the justice and equity of their situation relative to those around them is a central concern whether for exploitation by SOF or for inoculating partner nations from the threat of subversion by state or non-state actors.

Popular legitimacy and relational accountability are entirely subjective. They result from personal and group reflections on and assessments of experiences in the context of expectations. They have less to do with formal governmental structure and more to do with the realities of life given cultural and social norms. While the Western mind is conditioned to think in terms of procedural legitimacy, such as with formal democracy and law making, this perspective is incomplete. Moncrieffe notes, “Within democracies, people may, in principle, have the freedom to choose – the liberal component (although even this may, in practice, be circumscribed) – but they may not have real freedoms, particularly to improve the quality of their lives. Furthermore, the limited electoral choices they are allowed can, in actuality, amount to a choice among degrees and forms of oppression.”<sup>216</sup> Much of the reason for the Sunni insurgency in Iraq in 2004 was the perception that the U.S. would install a democratically elected, Shiite-dominated government which would effectively result in the Sunni population’s oppression. The fear was eventually reinforced by the creation of a Parliament without effective veto rules on Shiite majority decisions, and it was only the military and political influence of the U.S. as a basin of attraction that directed the Sunni political flow toward the state for a time. Once the U.S. basin broke in

2011, new flows to rival basins of attraction immediately began, precipitating in part the eventual conquest of predominantly Sunni areas of Iraq by ISIS in June 2014.

Informal, cultural institutions, such as tribes or traditional kingdoms, or competitor non-state actors, like narco-trafficking and terrorist organizations, can garner more popular legitimacy than formally recognized, “legitimate” governments. They sometimes form alternate basins of attraction with strong flows of popular legitimacy that drain the government’s own. To determine the potentially legitimate or competing basins of attraction, one must “examine the multiplicity of cultures that actually help to shape political systems in different ways, even within the same country context ... Patterns of meanings are also entirely consequential for whether and how people engage as citizens. They develop out of people’s varied experiences of citizenship and, in turn, provide a lens for interpreting these experiences.”<sup>217</sup> Appreciating the context with a wide variety of perspectives is crucial for mitigating the impact of system 1 biases. The implication of the Complex Adaptive Systems perspective is that intelligence is incomplete if it fails to incorporate the ethnographic, sociological, and micro-political components, for it is at this level that strategic surprise eventually bubbles to the surface.

## **The State as a Flow of Power**

The myth of stability is about the myth of control. Control, power, and authority are not necessary to establish stability. Rather, complexity science shows that system interactions can reach a self-organizing and replicating stability on their own through the process of emergence.<sup>218</sup> In fact, stability formed in this way can be quite sticky due to the natural flow of the pixels to the patterns, so the challenge is oftentimes better framed in terms of how to harness or redirect flows in a co-evolutionary framework so that the institutions of state run with the flows of society and allow for positive bottom-up solutions.<sup>219</sup> Installing authority from the top-down oftentimes just creates friction against the natural flows—friction that myriad flows can erode over time.<sup>220</sup>

Remember for a moment the dynamics of wicked problems. Governments encounter problems imposing solutions when they see the world in terms of a linear, variable-based, problem-solving mindset seeking equilibrium in social relations. As Colanders and Kupers point out: “The complexity

frame conceptualizes the social system as a complex maze of interrelationships, with enormous micro-level changes underlying any seemingly static concepts. What might appear to be a stable macro equilibrium is actually the outcome of an underlying micro disequilibrium of constant change.”<sup>221</sup> Equilibrium is always a temporary moment in time and also a function of the level of abstraction chosen as a frame through which to view the context.<sup>222</sup>

Here it is useful to return back to the Cynefin Framework to “sense-make” the operating environment. Where there are weak or very permissive governmental and social structures, there is excellent opportunity for emergence and the expectation should be for a high degree of morphogenesis. The political system may self-replicate, though changes to the basic order might occur periodically; in the U.S. context, for example, think of the 19th Amendment to the U.S. Constitution granting women the right to vote ratified only in 1920. Where there are strong or very restrictive governmental and social structures, there is less interaction among people and groups for emergence, so the expectation should be for clear patterns or regularities, though morphogenesis is taking place in the available safe space wherever that might be, such as in universities, religious institutions, or basements. When changes occur, they tend to happen in rapid tipping point moments when the dam breaks and the social flows move to new, sometimes shallow basins of attraction. SOF tend to operate in environments where the potential for emergence is high due to weak government or after the dam breaks, called “far-from-equilibrium” environments. Morçöl explains:

Some systems may move toward equilibrium conditions sometimes, but more often systems shift away from equilibrium. When a system is ‘far from equilibrium,’ the fluctuations in it may lead to new, unstable behavior. Under far-from-equilibrium conditions, systems are unstable and sensitive to external influences. They are more adaptive to their environments, and minute changes in the components of a system may lead to large-scale changes. Under far-from-equilibrium conditions, a system reaches a bifurcation point. At that point it chooses between two paths: It either decays into chaos or reorganizes at a higher level. This is a form of nonlinear phase transition ... The laws of equilibrium are universal, because matter near equilibrium behaves in a repetitive way ... But under

far-from-equilibrium conditions, there is no repetition; a variety of options open up for a system's behavior.<sup>223</sup>

Under such circumstances, it is impossible to predict how a system will behave at the macro-level. Instead, focusing on local level dynamics can at least offer a sense of the flows at play and the potential basins of attraction toward which they might trend.<sup>224</sup>

There is an important theoretical and operational effect between thinking in terms of coordinating social, economic, and political flows and controlling them through a central hierarchy.<sup>225</sup> Under far-from-equilibrium circumstances, it might actually be more beneficial for SOF to purposefully search for, discover, and amplify a series of localized governance structures—organically legitimate and relatively stable basins of attraction—and then through creative abduction seek mechanisms to align their flows so that emergence influences the system toward a desired future.<sup>226</sup> In effect, this is what elements of UW, IW, CA, and MISO aim to achieve through different mechanisms. The problem emerges when these activities are implemented within a tactical to low-operational, near-term time horizon rather than a longer-term, high operational to strategic vision. Adopting the complexity frame might be the only real option since different populations in far-from-equilibrium environments experience it in qualitatively unique ways and from qualitatively different starting positions. Under such circumstances the SDW improves the chances of appreciating the context beyond what the operational design process requires because it invites in the divergent perspectives that matter for the initial stages of planning. Otherwise, forcing populations to conform to a cookie-cutter approach through a centralized government might be unwise<sup>227</sup> and erode legitimacy as the dynamics of wicked problems become obvious.

## **The Impact of the Internet and Social Media**

While there have always been civilizational and communal identities, the ideas of nation and nationalism date back only to approximately the late-eighteenth century. Yet, they became so natural to the political sense of self that the nineteenth and twentieth centuries were riven by wars to secure them.<sup>228</sup> Benedict Anderson describes the nation as:

An imagined political community—and imagined as both inherently limited and sovereign. It is imagined because the members of even the smallest nation will never know most of their fellow-members, meet them, or even hear of them, yet in the minds of each lives the image of their communion ... In fact, all communities larger than primordial villages of face-to-face contact (and perhaps even these) are imagined. Communities are to be distinguished, not by their falsity/genuineness, but by the style in which they are imagined.<sup>229</sup>

Because it is impossible to personally know all who reside in the nation, great emphasis is placed on the invention of tradition<sup>230</sup> so that all members feel an affinity for one another and their territory. For nations to be viable over time, they must possess the fiction of being historically grounded. Anderson continues, “If nation-states are widely conceded to be ‘new’ and ‘historical,’ the nations to which they give political expression always loom out of an immemorial past, and, still more important, glide into a limitless future. It is the magic of nationalism to turn chance into destiny.”<sup>231</sup> There are three essential components of the nation:

The nation is imagined as limited because even the largest of them, encompassing perhaps a billion living human beings, has finite, if elastic boundaries, beyond which lie other nations.

It is imagined as sovereign because the concept was born in an age in which Enlightenment and Revolution were destroying the legitimacy of the divinely-ordained, hierarchical dynastic realm.

Finally, it is imagined as a community, because, regardless of the actual inequality and exploitation that may prevail in each, the nation is always conceived as a deep, horizontal comradeship.<sup>232</sup>

What enabled the formation of the national imagination, in Anderson’s analysis, were the establishment of national languages and print media in the eighteenth and nineteenth centuries. These factors formed together as printing required more standardized language, which in turn contributed to a sense of shared national experience.<sup>233</sup> In the twentieth century, states poured previously unimaginable resources into the effort to create the sense of the nation and nationalism through education and entertainment experiences. The rapid expansion of radio, basic education, print media, movies,

telephones, and later television transformed the information space in the twentieth century often for the purpose of reinforcing the nation-state project.

The inherent danger in the idea of the nation being an imagined community is that it is threatened by other imagined communities. The nation-state held the advantage for decades because the national identity was synonymous

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*The internet promotes unprecedented connectivity and the opportunity for morphogenesis because it increases by orders of magnitude the potential number of interactions in the system of systems.*

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with territory and local community and was eventually enshrined in international law. In the internet age, this advantage still holds, but is certainly more contingent. The internet promotes unprecedented connectivity and the opportunity for morphogenesis because it increases by orders of magnitude the potential number of interactions in the system of systems. Moreover, the internet and affordable cellular communication eliminate the twin

tyrannies of distance and time. Now people can communicate, share enormous amounts of information, and even manufacture items in real time from half way across of the globe.

Social Network Theory identifies two key contributing factors to social innovation and morphogenesis which were only briefly touched on previously in chapter 5: propinquity and homophily. Propinquity is the idea that two or more people or groups are more likely to be linked to each other if they are geographically near each other, especially if a common experience or interest (work or entertainment, for instance) brings them in frequent contact.<sup>234</sup> Homophily occurs because two or more people and groups share characteristics (such as ideology, interests, norms and values, or experiences) in greater proportion to the people around them.<sup>235</sup> Whereas the tyrannies of distance and time used to create *de facto* constraints on even the possibility of interaction across states and populations, the internet now obliterates them as factors leaving language the remaining barrier.<sup>236</sup>

Social media in particular is dedicated to identifying potentials for homophily and propinquity. Social media algorithms and other apps find ways to bring people together based on interests and values of almost every variety and stripe; think back to the Uber example in chapter 2. It is now possible that people have more in common with others in foreign countries than

their own neighbors and the opportunity to interact with them in real time, a structure that makes extra-national imagined communities entirely viable.

Looked at another way, the internet eliminates the friction of distance and time to enable the flow of ideas, capital, technology, information, and other resources.<sup>237</sup> One observer likens the situation to circuits of people, groups, and supply chains. These circuits “have a life of their own” and represent agents whose interests attach to subnational nodes rather than their own nations.<sup>238</sup>

The internet messes everything up because it creates the possibility for nations of the mind to form in contrast to nations of territory and heritage. It empowers the pixels to form new patterns no matter where they reside, to bring new interests, loyalties, and non-national identities to the fore when in the past they could not generate the social mass to matter. If, as Khanna argues, “the fundamental property of all systems is to maximize *flow*: allowing all parts of a system to connect to all other parts,”<sup>239</sup> then the internet is the quintessential conduit. Whether it is traditional territorial based nationalism or the nationalism of, perhaps, an imagined caliphate,<sup>240</sup> the nation can still find its members, bring them together, and flow power thanks to the internet and social media. This potential for morphogenesis is not going away, making the internet the single most important contributor to nonlinear, complex dynamics in the twenty-first century.

## A New Appreciation for Nations of the Mind

Hopefully, this brief, alternative exploration of the state offers a useful way of thinking about population-centric issues and the SDW’s value to SOF is now clear. Viewing the state only through a traditional frame brings with it a range of assumptions that potentially form impactful blinders. It takes a dedicated, system 2 learning effort to critically evaluate the hidden assumptions. In this example, the authors introduced Complex Adaptive Systems theory to show that even minor interactions between actors in far-from-equilibrium environments can produce nonlinear, emergent effects that drive the system in unpredictable directions as new attractors form.<sup>241</sup> Further and in this context, the discussion on the internet age illustrates how technology now creates unparalleled opportunities for emergence and morphogenesis, and the advantage the nation-state once held in generating mass loyalty and identity is now compromised. The new operating environment requires a new

way of perceiving the system of systems so that change becomes a natural expectation and a force to be navigated instead of a problem to be solved.

The operational and strategic implications of this appreciation could enable SOF to reimagine the operating environment in important ways. In fact, the territorially-bound nation as imagined community has been weakened for decades. For example, a form of “sub-politics” has emerged from the international anti-capitalist, anarchist, and environmental social movements which Graham Taylor describes as emanating from the rejection of existing national and international government institutions and resulting in a “generalized and centerless form of politics.”<sup>242</sup> The nation-state has and earns no legitimacy from this culture group, rather the planet is the central referent of identity and citizenship is premised on the abstract “right to have rights.”<sup>243</sup> Taylor argues that this “Alternative Globalization Movement” (AGM) cannot be comprehended from the traditional perspective of a “nation” because it forms nonlinearly and dynamically through subjectively crafted meanings dependent on time and place.<sup>244</sup> Unsurprisingly, he notes:

There has thus been an increasing tendency to portray social movements as fluid-like and marked by irregular and unexpected upsurges in activity and protest. Rapid mobilization is presented as the result of endogenous, self-reinforcing processes where small events and changes are amplified by positive feedback loops towards a ‘contagion effect’ and protest spreads like a forest fire ... The existence of free space allows movement through borders and boundaries such that social movements are able to transmute in unexpected locations.<sup>245</sup>

With the AGM having been born out of the anti-Western, anti-hegemonic social movement world, it is not altogether a stretch to hypothesize that members of the Islamist Jihadi movement have participated in and adapted these techniques.<sup>246</sup> Indeed, on the surface there appear to be many parallels between the operations of the AGM and many internet and social media savvy organizations, like ISIS, that cultivate and put into action members of a non-territorial imagined community.

Demographically speaking, new nations of the mind might sprout simply by the homophily and propinquity fueled by the internet. Khanna cites a Zogby Analytics poll that finds first “globals” identify connectivity and sustainability as their prime values. They aren’t automatically loyal to the establishment at home or feel secure behind the borders that separate them

from ‘others’ abroad.”<sup>247</sup> Indeed, Khanna proposes a number of compelling, alternative ways to view space and time. He contends that political geography (maps depicting political boundaries) should give way to “connectography” because territorial divisions as enshrined by nation-states are being superseded by connective infrastructure like highways, megacities, and the internet.<sup>248</sup> At the same time, this connectivity stimulates devolution within nation-states as cities and their surrounding regions constantly adapt to the competitive connectivity of the global supply chain, sometimes through direct agreements with other foreign cities and companies.<sup>249</sup> Instead of military conflict, Khanna envisions a Great Supply Chain War, which is “a race not to conquer but to connect physically and economically to the world’s most important supplies of raw materials, high technology, and fast-growing markets ... [and] infrastructure, supply chains, and markets are as crucial as territory, armies, and deterrence. The largest power does not always win; the most connected one does.”<sup>250</sup>

By adopting a frame of supply chain connectivity between cities and regional nodes instead of political division between states, Khanna perceives interesting dynamics, such as the potential for “neo-medievalism,” the rise of cities as the locus of power,<sup>251</sup> and the formation of infrastructure alliances.<sup>252</sup> He places great emphasis on the emergence of megacities due to their population size and economic value and notes the majority will fall within 50 miles of major water ways.<sup>253</sup> He further perceives a trend in which “Mega-infrastructure overcome the hurdles of both natural and political geography, and mapping them reveals that the era of organizing the world according to political space (how we legally subdivide the globe) is giving way to organizing it according to functional space (how we actually use it) ... As the lines that connect us supersede the borders that divide us, functional geography is becoming more important than political geography.”<sup>254</sup>

In a world of rapid emergence, appreciating connections offers truly useful insight and certainly orients the mind differently than one steeped in political division and power politics. Khanna criticizes traditional political maps for their limited representation of the human experience.<sup>255</sup> Instead, they should be a “synthesis of environmental science, politics, economics, culture, technology, and sociology—a curriculum curated through the study of connections rather than divisions,”<sup>256</sup> because competitive connectivity is characterized by “devolution (the fragmentation of authority toward provinces), urbanization (the growing size and power of cities), dilution

(the genetic blending of populations through mass migration), mega-infrastructures (new pipelines, railways, and canals that morph geography), and digital connectivity (enabling new forms of community).<sup>257</sup> Connectography has in Khanna's mind a political significance in that it focuses on the "lines we are installing *now* rather than the many contingent and arbitrary lines drawn in the past."<sup>258</sup>

The introduction asserts that the most impactful blinder to SOF is the state. This is because, as Khanna warns, many people "still hold political boundaries to be the most fundamental man-made lines on the map out of a bias toward territory as the basis of power, the state as the unit of political organization, an assumption that only governments can order life within those states, and a belief that national identity is the primary source of people's loyalty."<sup>259</sup> According to the Complex Adaptive Systems perspective, social organization is possible in ways different, but potentially as meaningful as that instituted by formal government, and the rate of change at the micro-level will only increase in the future leading to unforeseeable influences at the macro-level of intra- and interstate relations. In a world of imagined communities, it is quite possible that the nation as the focus of identity could in the twenty-first century become less certain as notions of legitimacy decouple from the state and groups engaged in sub-politics fall prey to manipulation by external actors.

## Key Terms

Relational Accountability, Imagined Community, Nations of the Mind

## Summary

- While Americans typically focus on international legal sovereignty as the basis of a government's legitimacy, relational accountability is how populations within a state determine its legitimacy.
- In far-from-equilibrium environments, it is advisable to discover natural basins of attraction and through creative abduction determine how they can be joined to form a self-replicating regularity instead of imposing authority from the top down, especially in the absence of organic links to the population.
- Imagined communities flow to basins of attraction (ethnicity, nationalism, ideology, interests, etc.), which used to be monopolized by the

nation-state, but they now have a wider variety of options for legitimate expression as a result of the internet.

- Technology and commercial interaction are changing the way people perceive their interests and align their loyalties such that nations of the mind credibly compete for legitimacy with territory-based nations as imagined communities. Framing challenges solely through the idea of the state presents significant blinders to other trends operating below and above the level of the state.



## Chapter 7. Design Thinking: Defining the Problem and Developing an Approach

### A New Appreciation

Think back for a moment to the first paragraph of the monograph describing the advances of the Taliban, the rapid rise of ISIS, and the U.S. military effectively aligning with Iran's interests in the fight to retake parts of Iraq. Viewed through the paradigm of the state, the strategic landscape looks like a mess. How can stability be restored when there are no good options for installing or supporting legitimate governments? Generally, the system 1 solution is to support the authority and control of allied governments through FID and economic development assistance. Hopefully, the journey through system 2 thinking in the preceding pages prompted the consideration that government-centric, linear, authority and development models work against the dynamics driving many operating environments.

Appreciating the context from a Complex Adaptive Systems frame generates new ways of thinking about many of the wicked problems confronting SOF in the twenty-first century. For example, as the re-conquest of ISIS held territory proceeds, what nonlinear, second and third order effects await the U.S. and SOF in particular? Was ISIS the problem needing only a military solution through the empowerment of local proxies or was ISIS just a symptom at the surface with the real problem lying far below the surface? Did ISIS serve as a useful basin of attraction with its elimination opening the door to some new basin, and what attractors might attract the flow of popular support? How might the USG and SOF create local basins of attraction—perhaps functional at first and later political—such that flows of popular support run faster and deeper to them than Islamist or ethno-sectarian ones? What morphogenic impacts did ISIS have on the youth that might manifest in destructive patterns in five years without an intervention in this subsystem? How might viewing Eastern Syria from a connectography perspective alter SOF operations to reinforce positive basins of attraction?

Instead of seeing instability, SOF can interpret the devolution of authority to new, more organic, and perhaps legitimate basins of attraction. From the complexity frame, the challenge is creating formal opportunity structures

for the range of bottom-up solutions to sprout and eventually merge.<sup>260</sup> What that might look like and the form taken in building relationships is likely to be different in each context. It requires appreciating concepts of legitimacy, social tension, and power dynamics among groups as seen through the eyes of diverse local populations and from multiple angles within them.<sup>261</sup> The activities SOF need to undertake in each environment then result from the best application of its diverse skills rather than predetermining how to restore stability through the extension of governmental authority and control.

From a design thinking perspective, it is the deep learning undertaken during extensive and often exhausting iterations of appreciating the context that defines the range of possible futures. New appreciations lead to new possibilities even if the pieces are not yet in place to influence the system as desired. Creative abduction is what empowers people to build toward the desired future. While not linear in substance, it at least allows people to think in terms of “influencing the system.” Once a desired future is chosen, the next element in the SDW is defining the problem.

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*New appreciations lead to new possibilities even if the pieces are not yet in place to influence the system as desired.*

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## Defining the Problem

The phrase “define the problem” has a very specific meaning in the SDW. While system 1 thinking induces most people to view the problem as the tip of the iceberg—the irritant demanding attention—there is much below the surface. The iceberg model (fig. 4) illustrates that the problem is often just the superficial and visible symptom of underlying conditions, trends, and patterns. In other words, the problem most of the time is not really the issue.

The real problem most of the time is how the issue is framed and how formal and informal structures codify and incentivize behavior to deal with the issue. In other words, the define the problem element in SDW is typically about overcoming personal and organizational blinders. Since systems operate through structural relationships, problems are typically the result of tensions between the desired future and how the system’s structures have been made to interact. But structures themselves result from mental models or paradigms. Influence at the systems level is most effective if it affects

peoples' paradigms, because from paradigms flow the goals structures should strive to achieve, guidelines on appropriate behavior, and, consequently, the patterns and trends of behavior over time.

Complex Adaptive Systems theory illustrates that to move the current context toward the desired future, new basins of attraction need to be introduced. These might come in the form of linking people together, creating formal or informal structures, or even just introducing and disseminating new concepts and vocabulary to influence how people frame issues (hence, this monograph). The problem in define the problem is, therefore, the gap between what currently exists in the mental models and structures in the system and what is determined through the process of creative abduction to be necessary to direct the flows to new basins of attraction.

Defining the problem is perhaps the most cognitively difficult aspect of the SDW. It demands one juxtapose many competing and often paradoxical perspectives and then make qualitative and subjective decisions about future trends.<sup>262</sup> Doing this as an individual is hard—doing this collaboratively is extremely hard. Everyone on a team sees things a bit differently requiring a synthesis of perspectives, but this also enriches the SDW. These many interpretative frames each reveal their own truths about the system and its behavior. Much like a mosaic, the individual pieces together reveal a broader holistic view from which to make qualitative judgments and evaluations about the system as it is, its inertia, its propensity for and rate of change, and its possible futures.

Confronting open, Complex Adaptive Systems requires cautiously scaling and scoping the problem. Given the enormity of many socio-political and bureaucratic problems, it is necessary to consciously determine how much of the elephant to bite off. The scale and scope of the problem must be sufficiently broad but not beyond one's capacity to affect change. Said another way, it is oftentimes better to go small rather than go big in scale and scope because even small, successful interventions in the system can have significant influence in how it operates down the line. As time passes, the learning continues leading to new appreciations that might change how the problem is seen, so scope and scale have to be periodically revisited as new opportunities for intervention open and others close. Returning to the Rhode Island Office of Veterans Affairs vignette (fig. 14), the new appreciation of the context yielded a desired future that quickly focused attention on the gap in the system of Veterans assistance systems (represented by the

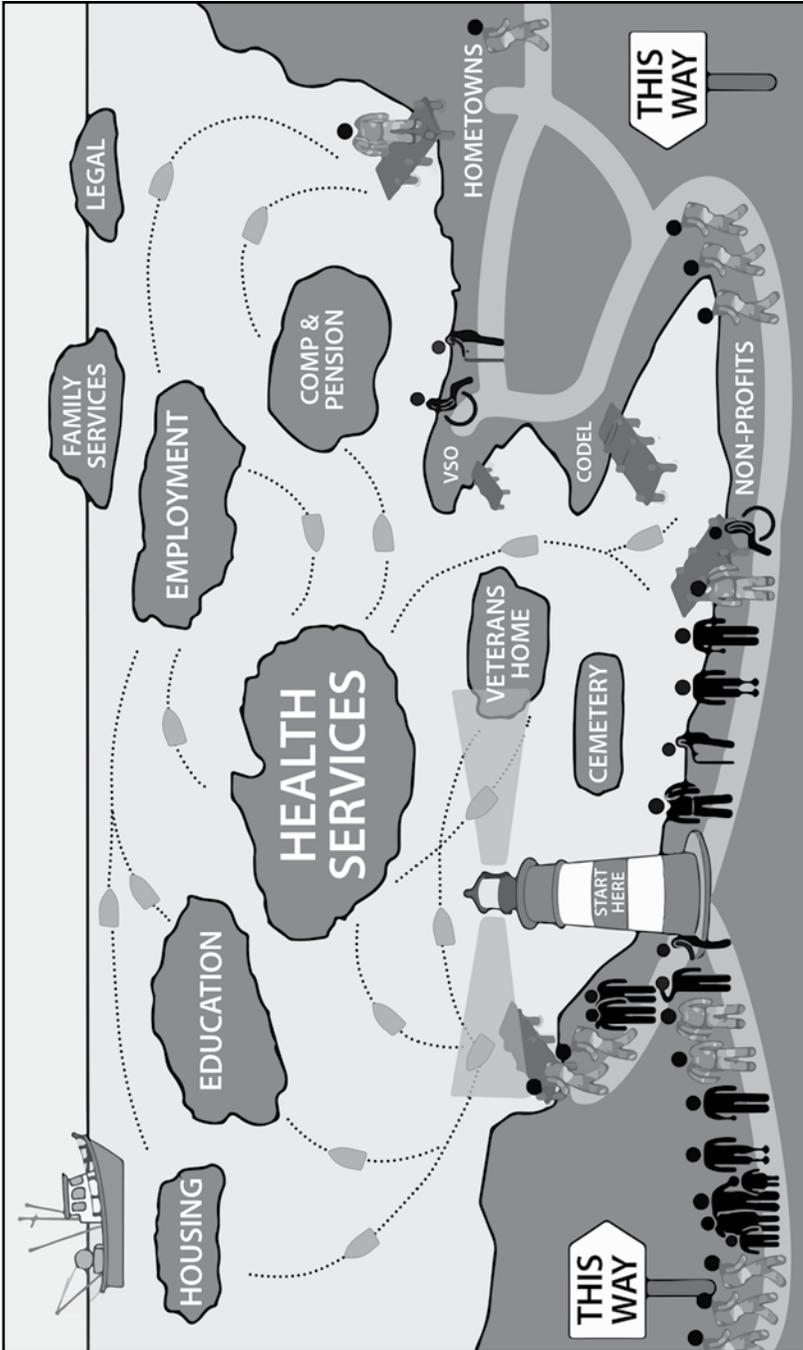


Figure 14. Rhode Island Veterans Administration Visualization of the Approach.

islands in the visualization). The approach immediately followed and is being put into effect today.

### **Vignette: The Rhode Island Office of Veterans Affairs—Defining the Problem**

After a few iterations of appreciate the context, the Rhode Island National Guard and RIVETS established their desired future and produced a problem statement identifying the mental model and structural gaps in the Rhode Island veterans service provider community. Note how the approach visualization introduces a new connective hub, a metaphoric lighthouse to illuminate where members need to go, and emphasizes the importance of relationships to achieve a behavioral change in the system, represented by a series of ferry boats connecting members to the islands. The SDW enabled the Rhode Island Office of Veterans Affairs to become self-aware of its traditional paradigms of doing business and by 2017 to adapt the agency's business practices for contemporary veterans issues, needs, and interests.

**Problem Statement.** “There is strong public support for Rhode Island’s Veterans and their families. This ‘sea of goodwill’ has led to a robust array of programs and services for those who have served and those who support them at home. Nevertheless, these resources and well-intentioned efforts are too often fragmented and disjointed. Moreover, there is no strategic messaging around the programs that exist or how Veterans can access them. In other words, we have the services available, but lack the communication, collaboration, coordination, and collective purpose to truly maximize their impact to improve the health and economic well-being of those we serve.”<sup>263</sup>

**The Approach.** “Imagine a network of providers that serves the needs of current and former service members and their families, connected by a secure, web-based referral platform, and supported by a ‘coordination center.’ With a robust outreach and communications campaign, Veterans will either know how to access this network or be able to find it quickly and easily using popular search engines on the web. Member organizations of this network will understand the interrelated nature of the challenges our Veterans face. They will commit to being true partners with other network providers, and will work selflessly with them to meet the often multiple, overlapping needs of those we serve.”<sup>264</sup>

## Developing an Approach

As an action-oriented design thinking framework, the SDW conceptualizes developing an approach as the vision for intervening in the scoped portion of the complex system to influence, shape, change, or even sustain factors related to the problem. Rather than a roadmap to the future, the approach is the broader strategy for overcoming or mitigating the gap between the current context and the desired future. Recall that developing an approach generally receives about ten percent of the SDW effort because, once the hard work of appreciating the context and defining the problem has culminated, an approach to influencing the system tends to stand out.

An approach can intervene at multiple levels. In some cases it will inform and shape planning or policy guidance, longer horizon resource decisions like the Program Objectives Memorandum (POM) process, or research and development priorities. In other instances the same learning and appreciation will enable the prioritization of current and near future priorities. More often an approach contributes to organizational alignment of thought and action across functional, policy development, and political offices. For an approach to be effective, an organization must be a learning organization willing and able to create, implement, and adapt the Approach as systemic conditions inevitably evolve.

The SOCNORTH Commander's Vision Framework vignette (fig. 15) illustrates how a design inquiry establishes new mental models, new structures of engagements, and new patterns of behavior which can be applied against discreet goals and objectives from appreciation of the context to an approach. One can also see from this vignette how developing an approach bridges the SDW with Operational Design and Operational Planning. In essence, an approach becomes Commander's guidance once it moves from inquiry into action. Whereas SDW is self-consciously directed toward divergent thinking to overcome the impact of blinders, putting an approach into effect requires convergent thinking and processes over the short term. Operational design and operational planning are often useful for aligning the efforts of disparate units, components, directorates, agencies, and partner nations. There are discreet moments when seeking an end-state is appropriate. It is just a matter of properly recognizing them.

## Vignette: Paradigm Shift and New Approach at SOCNORTH

In September 2016, SOCNORTH Commander Brigadier General Christopher Burns sponsored a design inquiry facilitated by SDW faculty from the Joint Special Operations University and the Rhode Island National Guard Special Operations Detachment-Global. Having served as deputy Commander at SOCCENT, General Burns recognized the intrinsic differences between the SOCCENT and SOCNORTH AORs. The design inquiry explored the role SOCNORTH should play as a TSOC given the constraints placed on it by the U.S. Constitution. Note the emphasis on mental models and SOF identity in both the appreciation and the desired future in the resulting (U) Commander's Vision Framework.

**A New Appreciation.** "SOCNORTH operates in a multifaceted environment, similar to a sports complex. Other TSOCs achieve their ends by playing baseball. While we play baseball in many of the same ways as other TSOCs, we are also part of many different teams (i.e. FBI, DOE, DHS, etc.) that play different games with varying rules. We are not always the quarterback or pitcher, sometimes we have a significant supporting role as a midfielder. Therefore, we are not just baseball players, but instead we are *decathletes*, capable of excelling at multiple sports [emphasis added].

**Our Future.** "SOCNORTH is an organization that defends the Homeland in depth by creating a framework for 'Cooperative Action' with our DOD, IA, and international partners. We will complement the efforts of our international and IA partners while supporting, and, when appropriate, leading DOD efforts in the NORTHCOM AOR."

**Our Approach.** "To achieve our desired future, SOCNORTH must ... Broaden our Aperture ... Expand and refine our Capabilities ... Build our Network."<sup>265</sup>



Figure 15. SOCNORTH Visualization of the Commander's Framework.

## Chapter 8. Conclusion

With each step forward, with each problem which we solve, we not only discover new and unsolved problems, but we also discover that where we believed that we were standing on firm and safe ground, all things are, in truth, insecure and in flux. - K.R. Popper<sup>266</sup>

As USSOCOM celebrates its 30th anniversary, it is an opportune time to reflect upon and think about how the SOF enterprise views itself, its place in world affairs, and the dynamics shaping how people and nations interact. The environmental conditions that gave birth to USSOCOM—the Cold War, the primacy of the nation-state, the faith in technology and planning, the tactics of terrorism, and the dynamics of low intensity conflict—have changed in myriad ways. Yet the SOF enterprise, like all institutions, continues to self-replicate based on the paradigm of the by-gone era. For certain missions, this path dependency is not necessarily problematic; for others, it could be potentially catastrophic to continue business as usual.

As General Votel sensed, it is probably time to take an honest look at the efficacy of the SOF enterprise relative to emerging and future requirements. The acceleration of political, social, and technological change portend a nonlinear, unpredictable, and turbulent future with instability, as viewed from the state-centric perspective, likely only to increase. Given the current level of stress on the force, it is fair to assume the SOF enterprise will not have the bandwidth to stem all the threats flowing through all the fissures in the state system. Once the money and manpower run out, system 1 thinking will eventually give way to more deliberate system 2 thinking. The authors believe the force has arrived at this point even if the policy makers and bureaucracy lag behind.

While the substance of the monograph focused on the state-oriented aspects of traditional SOF core activities, the SDW has as much or more relevance to the countering weapons of mass destruction (CWMD) and Counter-Transregional Threat Organization (CTTO) missions recently assigned to USSOCOM.<sup>267</sup> In the interests of space, these missions were not highlighted in the text, but the concepts discussed in chapters 1 through 6 underlie them. The CWMD and CTTO missions are quintessential wicked problems

requiring SOF to reimagine their own cultures, paradigms of power and influence, and ways of working by, with, and through others.

While working in a joint environment often seems challenging enough, tackling threats that are inherently joint, interagency, intergovernmental, multinational, and commercial (JIIM-C) are magnitudes more complex since authorities and permissions are distributed across a host of co-equal partners. In short, JIIM-C missions are coalitions of the willing where personal, professional, and organizational paradigms determine whether participants volunteer their limited resources and manpower. Nothing about this is linear. It is entirely subjective and demands a level of intentional creativity not often found in government bureaucracy. Establishing shared appreciations of the context are crucial for action in such missions as divergence in appreciation typically results in incoherent and uncoordinated interventions in the system.

The SOF enterprise's key challenge in the coming years is to culturally move past its reliance on system 1 thinking to deliberately appreciate the wicked problems confronting it. The authors hope they provided the essential concepts, vocabulary, and framework for doing so in a more productive way. Because of technology, emergence is the most important dynamic of the contemporary era, and systems thinking is necessary to perceive and act upon the potential for emergence. As Nelson and Stolerman note, "systemics is the logic of design."<sup>268</sup> If SOF are to get in the game, they need a framework to both interpret systems and engage them. SDW is the framework for SOF.

## **Doing Wrong Really Right Still Goes Wrong**

Resistance to change is common, especially in highly successful organizations. One could look at the SOF enterprise longitudinally from the 9/11 attacks to the present day and clearly argue, for instance, that it is the industry leader in fighting terrorism. But what if terrorism is actually just a symptom, not really the problem? Russel Ackoff concluded after years of research and experience that "errors of omission, lost opportunities, are generally more critical than errors of commission. Organizational failure more often comes because of what an entity did not do than because of what they did."<sup>269</sup> For him, it is much better to do the right thing wrong, than to do the wrong thing right because the latter promotes replicating simple solutions until the organization falls right over the edge into chaos.

The SDW invites the real potential that SOF could be shown to be engaged in the wrong type of activity or that its structures and paradigms are incongruent with emergent conditions. If the enterprise adopts the attitude of a learning organization, the SDW can provide real value. If the enterprise hunkers down and protects its “truths,” the SDW will be severely constrained. Kadushin, though writing about private sector bureaucracy in general, captures the dynamics so many in the SOF enterprise regularly experience:

Management often simultaneously sends two contradictory messages. The first is an appeal to be entrepreneurial, change, innovate, network, be flexible, and be empowered. Second, and at the same time, management insists that it be consulted about all initiatives and maintain its prerogative to veto new ideas. Anything else is seen as an affront to authority. This is a double bind. The mid-level executive is caught in a no-win situation because both imperatives cannot be fulfilled simultaneously ... More often than not, however, the system is mired in the status quo while its members wonder why nothing changes.<sup>270</sup>

The danger occurs when an organization’s culture becomes rigid and reinforces the myth that what it does is the right thing and then internalizes the activity as its core identity. This dynamic is a function of the expertise bias mentioned in chapter 1. Ackoff further warns that there is “nothing harder than to topple the fact that supports a deeply held prejudice denied by its holder.”<sup>271</sup> SOF have innovated, have accomplished extraordinary tasks, have protected the nation from further harm, and they should take pride in their creativity over the years. General Votel’s caution, though, is to deliberately think about the operating environment—the changes in national, sub-national, and supra-national dynamics—to determine if the activities SOF engage in are the right ones for the context.

Clearly, leadership is crucial in the SDW. Commanders set the tone for discovery, and if their initial guidance is too restrictive or if they dismiss results that contradict biases and prejudices, the SDW will have only marginal value. However, if the Commander embraces the SDW as an attitude and ethic, the rewards could be extraordinary. This means that Commanders must have tolerance for innovation, disruptive questions, and, to Ackoff’s point, the occasional failure. The SDW is qualitatively and substantively

different than what most SOF have experienced, but it stands a better chance of determining the right thing to do which benefits everyone in the end.

## **I Don't Have Time! Where to Focus Your Effort**

The biggest hurdle to deliberate, system 2 thinking is the tyranny of time—there just never seems to be enough time in a day to deal with mundane tasks let alone devote considerable time to reflection and deep thinking. The response to the question, “have you studied or looked at that issue closer?” is more often than not, “I don't have time.” This response epitomizes the sense of urgency felt and seen across the enterprise and not just in operations centers. For those at the tactical level, urgency is a key driver. In other parts of the enterprise there is confusion between importance and urgency. The decade-long heightened sense of urgency for SOF has eroded the capacity and capability of the enterprise to promote organizational learning because it has culturally impelled personnel to rely on system 1 thinking.

Indeed, SOF are creative, solution oriented, and respond quickly to emergent challenges. In the community there is a common phrase that “we operate at the speed of SOF”—a comparison to the CF asserting that SOF operate at a pace unlike any other in the DOD. This might well be valid. It is also valid that this same underlying ethic has contributed to a culture that limits the allocation of time for reflection and incentivizes decisiveness and action. Not all circumstances permit reflection, but certainly there are many situations that would be better served by slowing down, reflecting and appreciating the context, and figuring out what the real problem is.

Consequently, the effort must begin with leadership's conscious decision to prioritize a few days of labor for appreciating the context over fighting off the alligators closest to the boat. While it might initially seem an inefficient use of time “to admire the problem,” the money invested in learning about systemic dynamics pays for itself when compared to the man hours wasted using the same ineffective routines against the same problems day after day, year after year. It requires the right framing and a belief that the benefits will accrue as subsequent iterations reveal more ways to intervene in the system.

The effort also benefits from forming a core team and having the discipline to schedule Inquiries at regular intervals. Doing so ensures that individuals are accountable for assignments, and the core team is typically able to align schedules more frequently than is the case with larger groups.

Establishing near term, medium term, and long term milestones on the path to the desired Future is also typically useful. Small interventions are often necessary to generate momentum, establish relationships, and set the stage for larger initiatives (morphogenesis at its best). All leaders need to see something tangible from a design effort, so being conscious about deliverables establishes credibility over time. As insights and opportunities for intervention become readily apparent, the standard objections to taking time for deliberate thinking usually disappear.

In cases where leadership is disinterested in design thinking, the effort typically benefits from informal working groups deciding to meet for a few hours at a time on a regular basis. While not optimal, it still enables a substantially improved appreciation of the context, though implementing approaches faces added hurdles without leadership firmly on board. Nevertheless, everyone has some latitude in how they do their jobs, so finding or cultivating colleagues interested in design can yield substantial gains so long as one takes the first step and decides to make time.

## How the SDW Can Help

Thirty years ago joint was a four-letter word and special operations survived at the margins of the Services. When USSOCOM was established in 1987, it became the very example of an intervention in the system that the SDW elucidates. Today, SOF have moved from joint to JIIM-C and special operations constitute the force of choice among America's leaders. Yet, the next thirty years of special operations history will be greatly shaped by the enterprise's ability to reflect on its sense of self, global sociopolitical and military dynamics, its resulting roles and responsibilities, and how its tactical actions can truly produce disproportionate strategic effects in the emergent future.

The environmental conditions into which USSOCOM was born have changed radically requiring new concepts, vocabulary, and ways of thinking for navigating through complexity and wicked problems. In the introduction the authors asserted: "The SDW provides the foundation for talking about, conceptualizing, deconstructing, analyzing, synthesizing, and acting in a complex adaptive world. It is a way of perceiving complexity and an attitude for operating in it. Above all, the SDW is an ethos of learning and discovery." There was much to review and introduce to justify this claim, and a few blinders to confront in so doing. The authors believe that the future of

SOF is bright if it can break free of its traditional paradigms and appreciate anew its opportunities. Accomplishing this, however, can only occur with a change in SOF culture to better align with the dynamics of complexity.

While the journey through theory and philosophy in the preceding pages has been difficult, the authors hope that the learning and insights were worth the pain on the other end. Again, this monograph was not intended to be a primer on how to conduct practical design inquiries; rather, its sole intention was to introduce foundational design concepts and apply them to one of the most impactful paradigms with which SOF contend: the state. But with luck, the concepts discussed will resonate with enough pixels in the SOF enterprise to form new patterns and, perhaps, to a stronger, more impactful picture of U.S. Special Operations in the twenty-first century. ↑

## Acronyms

<b>AGM</b>	Alternative Globalization Movement
<b>BPC</b>	building partnership capacity
<b>CA</b>	civil affairs
<b>COG</b>	Center of Gravity
<b>COIN</b>	counterinsurgency
<b>CT</b>	counterterrorism
<b>CTTO</b>	Counter-Transregional Threat Organization
<b>CWMD</b>	countering weapons of mass destruction
<b>DA</b>	direct action
<b>FID</b>	foreign internal defense
<b>ISIS</b>	Islamic State in Iraq and Syria
<b>IW</b>	irregular warfare
<b>JIIM-C</b>	Joint, Interagency, Intergovernmental, Multinational, and Commercial
<b>JPP</b>	joint planning process
<b>MDMP</b>	Military Decision Making Process
<b>MISO</b>	military information support operations
<b>MOE</b>	measures of effectiveness
<b>OPLAN</b>	operations plan
<b>PN</b>	partner nations
<b>POM</b>	program objectives memorandum
<b>RIVETS</b>	Rhode Island Office of Veterans Affairs
<b>SDW</b>	SOCOM Design Way

<b>SME</b>	subject matter experts
<b>SOF</b>	Special Operations Forces
<b>SOPs</b>	standard operating procedures
<b>USG</b>	United States Government
<b>UW</b>	unconventional warfare

# Glossary

1. **Agent-Structure Debate.** The recognition in the social sciences of the unending iterative process whereby social structures are created in the first instance by agents (people), but that the social structures then shape the reality of the world in which subsequent generations of agents act. (Chapter 2)
2. **Appreciate the Context.** The element of the SOCOM Design Way emphasizing the importance of learning about systemic interactions through the inclusion of divergent perspectives with a spirit of empathy. (Introduction and Chapter 1)
3. **Associative Memory.** The cognitive process whereby the mind accesses memory to discover past experiences similar to a current difficult question to derive an intuitive response, but subconsciously substitutes and answers a different, more familiar one resulting potentially in over-simplification of the issue. (Chapter 1)
4. **Basins of Attraction.** The concept in Complex Adaptive Systems theory that elements flow to attractors and level off in them so long as they serve as the best alternative, but emergence and morphogenesis create the potential for new attractors to arise leading to new flows over time. (Chapters 5 and 6)
5. **Bounded Rationality.** The idea that time and resource constraints, along with limits to human reasoning, restrict an individual's ability to achieve perfect information and act in a perfectly rational manner. (Chapter 2)
6. **Causal Inference.** In the physical and social sciences, the ability to establish a correlation between variables and an outcome resulting in a determination of cause and effect, albeit with a self-conscious degree of doubt about replicability of the findings. (Chapter 3)
7. **Causal Predictability.** In the physical and social sciences, the ability to establish a direct cause and effect relationship between variables and an outcome with a high degree of confidence and certainty of replicability. (Chapter 3)

8. **Closed System.** The ideal condition in the physical and social sciences whereby external environmental factors can be prevented from interfering with an experiment and all internal variables can be controlled to determine causal interactions among the variables. (Chapters 2 and 3)
9. **Complex Adaptive Systems Theory.** A body of literature across the physical and social sciences rooted to the principle that change through emergence and morphogenesis make naturally occurring, nonlinear interactions more prevalent than previously recognized by Reductionist approaches to scientific investigation. (Chapters 2 and 3)
10. **Creative Abduction.** A method of investigation that imagines a future occurrence and then logically reasons backward the conditions that must come to fruition over time in order for that future to manifest. (Chapter 4)
11. **Current Context.** A statement in the SOCOM Design Way that describes the present interaction of the system of systems determined after multiple iterations of Appreciating the Context. (Chapters 1 and 7)
12. **Cynefin Framework.** A sense-making model designed for determining the degree of complexity of a situation based on the ability to ascertain cause and effect that also serves as a management tool for recommending corresponding behaviors and actions under different circumstances. (Chapter 2)
13. **Deductive Approach.** A method of investigation that first employs logical reasoning to determine causal relationships among variables and then empirically tests data to determine the validity of the reasoning. (Chapter 4)
14. **Define the Problem.** The element of the SOCOM Design Way that clearly identifies the gaps in the system at the mental model and structural levels that need to be redressed to move the system from the Current Context to the Desired Future. (Introduction and Chapter 7)
15. **Design Inquiry.** A functional investigation of a wicked problem utilizing Design Thinking principles, elements, and practices. (Chapters 1 and 7)

16. **Design Thinking.** The ability to imagine that-which-does-not-yet-exist, to make it appear in concrete form as a new, purposeful addition to the real world. (Introduction)
17. **Desired Future.** A vision of the future in the SOCOM Design Way that is deemed to be the most favorable condition among the Range of Possible Futures and toward which interventions in the system are oriented over time. (Introduction and Chapter 4)
18. **Develop an Approach.** The element of the SOCOM Design Way that produces a concept for intervening in the system to move from the Current Context to the Desired Future and which typically serves as or informs Commander's Guidance in Operational Design. (Introduction and Chapter 7)
19. **Emergence.** An occurrence when a system takes on qualities and behaviors that cannot be predicted even with perfect knowledge of the variables constituting the system. The blending of variables yields a completely novel and distinct level of existence beyond the blocks comprising it. (Chapter 4)
20. **Empathy.** The capacity for being aware of, being sensitive to, and imagining the feelings of another's experience without having explicitly shared the experience. (Chapter 1)
21. **Framing.** The conscious and purposeful act of bounding one's thinking, the system, or the issue at hand, or the deliberate rubric an individual might use to organize his or her thoughts about a particular topic in order to facilitate investigation and learning. (Chapter 1)
22. **Heuristic.** A simple mental model, technique, or shortcut that helps an individual conceptualize or more deeply appreciate an idea or phenomenon. (Chapter 1)
23. **Imagined Community.** The idea that self-identifying groups of people, such as nations, exist as social fictions since the individual's feeling of belonging with others is imagined due to the fact that he or she will only ever know an infinitesimally small percentage of the community's members, yet the identity motivates behavior nonetheless. (Chapter 6)

24. **Inductive Approach.** A method of investigation that first engages in empirical testing of data to identify correlations among variables and then logically determines potential causal relationships for further testing. (Chapter 4)
25. **Morphogenesis.** The concept in Complex Adaptive Systems theory that variables in the social realm have the capacity to intentionally change and form new, emergent interactions to better achieve their interests thereby undermining Reductionist principles of scientific investigation. (Chapters 4, 5, and 6)
26. **Nations of the Mind.** The idea that individuals now have the ability through modern communications technology to view themselves as belonging to extra-territorial imagined communities thereby eroding the primacy of the nation-state as the locus of moral and political legitimacy. (Chapter 6)
27. **Open System.** The condition in the physical and social sciences whereby external environmental factors cannot be prevented from interfering with an experiment, and all the variables that impact a phenomenon can neither be fully known nor controlled internally, leading to potentially nonlinear interactions among variables and only conditional causal inference through scientific investigation. (Chapters 2 and 3)
28. **Paradigm.** An individual's beliefs about how the physical and social world works, which shapes how he or she sees, feels, senses, and thinks about reality. It informs ideas about cause and effect and creates blinders by highlighting certain aspects of reality at the expense of others. (Chapter 3)
29. **Path Dependence.** The process whereby people continuously replicate a behavioral pattern or an organizational practice based on institutionalized habit or the costs associated with organizational change regardless of whether it is suitable to the contemporary environment. (Chapter 1)
30. **Rationalism.** A model of human decision making and behavior in the social sciences that holds people act rationally to maximize benefits for themselves and minimize losses. (Chapters 2 and 3)

31. **Reductionism.** A systematic approach to scientific investigation that seeks to determine causal predictability by describing, explaining, and predicting a phenomenon through progressively reducing it to the interactions of its base variables. (Chapters 2 and 3)
32. **Regularities.** The self-replicating patterns of human behavior that appear to predictably recur over time. (Chapter 3)
33. **Relational Accountability.** The perception of legitimacy of a social order as a function of the degree of inequality and injustice experienced by a subgroup of a population based on its own expectations, especially as the institutions of governmental exercise power and authority over it in relation to the rest of the population. (Chapter 6)
34. **Satisfice.** The blending of the words “satisfy” and “suffice” to connote that an individual only seeks out information to the point he or she is satisfied there is sufficient data to make an informed decision instead of continuing the search to achieve a level of perfect information. (Chapter 2)
35. **Sense-Making Models.** Models designed to enable an individual to conceptualize the nature of the environment in which he or she is situated in order to determine how best to respond. (Chapter 2)
36. **System 1 Thinking.** The aspect of cognitive processing that enables the mind to engage in seemingly automatic, intuitive, and effortless problem solving, and that depends heavily upon past experience and familiarity to produce fast solutions. (Chapter 1)
37. **System 2 Thinking.** The aspect of cognitive processing that enables the mind to engage in a slower, more deliberate, and effortful form of thinking in order to challenge initial perceptions and operating assumptions. (Chapter 1)
38. **Systematic Analysis.** A process or method of investigation that emphasizes breaking phenomena down into progressively smaller variables and units of analysis, sometimes according to a structured rubric, in order to determine how they contribute individually to the functioning of the whole. (Chapter 1)

39. **Systems Thinking.** A frame of investigation related to Complex Adaptive Systems theory that emphasizes the interaction between social structures, the relationships between actors serving as connective nodes, and the potential for nonlinear, emergent phenomena to influence or change how systems and individuals behave. (Chapter 1)
40. **Wicked Problems.** Complex problems in open systems for which there are no recognizable cause and effect relationships, definitive solutions, or ways to determine all the potential variables interacting in the system. (Introduction and Chapter 2)

## Endnotes

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2. Frederick Kagan, Kimberly Kagan, Jennifer Cafarella, Harleen Gambhir, et al., “Al Qaeda and ISIS: Existential Threats to the U.S. and Europe,” *Institute for the Study of War* (U.S. Grand Strategy: Destroying ISIS and al Qaeda, Report One), January 2016, 8, <http://www.understandingwar.org/sites/default/files/PLANEX%20Report%201%20--%20FINALFINALFINAL.pdf>; Karen Yourish, Derek Watkins, Tom Giratikanon and Jasmine C. Lee, “How Many People Have Been Killed in ISIS Attacks Around the World,” *The New York Times*, 16 July 2016, accessed 7 November 2016, <http://www.nytimes.com/interactive/2016/03/25/world/map-isis-attacks-around-the-world.html>.
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5. Empathy in this context is an umbrella term described by USASOC as Human Factors analysis. See, *Human Factors Considerations of Undergrounds in Insurgencies, 2nd Edition*, ed. Nathan Bos (United States Army Special Operations Command, 2013), 3. The Marines have a history of population-centric engagement and continue to adapt as missions require. For example, see *Small Wars Manual* (U.S. Marine Corps. FMFRP 12-15, 1940). Note also that the widely referenced U.S. Department of the Army FM 3-24 Counterinsurgency Manual (2006) was jointly produced with the U.S. Marine Corps as MCWP 3-33.5.
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7. *USSOCOM History*, 129–135.; Richard Shultz, *Military Innovation in War: It Takes a Learning Organization – A Case Study of Task Force 714 in Iraq* (Tampa, FL: Joint Special Operations University, 2016).
8. Richard Newton, Tracy Moss, Charles N. Black, and Chris Phelps, “Design Thinking for the SOF Enterprise,” *United States Special Operations Command White Paper*, 29 January 2016, foreword.
9. Newton et al., “Design Thinking,” foreword.

10. *Joint Publication 5-0: Joint Planning* (U.S. Department of Defense), 16 June 2017, IV-1.
11. *ADP 5-0: The Operations Process* (Headquarters, Department of the Army, 2012), accessed 12 July 2017, <https://armypubs.us.army.mil/doctrine/index.html>, 1–3.
12. The concept of a design “way” is inspired by the work of Harold G. Nelson and Erik Stolterman, *The Design Way: Intentional Change in an Unpredictable World* (Cambridge: The MIT Press, 2014), 4–9.
13. Nelson and Stolterman, *The Design Way*, 12.
14. Kurtz and D.J. Snowden, “The New Dynamics of Strategy: Sense-making in a Complex and Complicated World.” *IBM Systems Journal* 42, no. 3 (2003): 462–483.
15. Newton et al., “Design Thinking,” 1–2.
16. “About: Campus Culture,” [www.risd.edu](http://www.risd.edu), accessed 4 August 2017, <http://www.risd.edu/about/campus-culture>. Its website states, “RISD’s culture of critique is based on constructive, inspirational and mutually supportive conversations, with students, faculty and staff interacting with openness, good faith and respect for differences.”
17. Nelson and Stolterman, *The Design Way*, 54.
18. Dan Ariely, *Predictably Irrational: The Hidden Forces that Shape Our Decisions* (New York: HarperCollins Publishers, 2008), 243.
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20. Daniel Kahneman, *Thinking Fast and Slow* (New York: Farrar, Straus and Giroux, 2013), 14.
21. Ariely, *Predictably Irrational*, 7-14; Banaji and Greenwald, *Blind Spot*, 8–13.
22. Kahneman, *Thinking*, 25–28; Banaji and Greenwald, *Blind Spot*, 3–8.
23. Malcolm Gladwell, *Blink: The Power of Thinking without Thinking* (New York: Little, Brown and Co., 2005), 225.
24. Kahneman, *Thinking*, 40.
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30. Gary A. Klein, *Sources of Power: How People Make Decisions* (Cambridge: The MIT Press, 1998), 271–273.
31. Kahneman, *Thinking*, 13.

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36. Gladwell, *Blink*, 11.
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41. Ibid., 14.
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43. David Strang and Wesley D. Sine, “Interorganizational Institutions,” *Companion to Organizations* (Malden: Blackwell Publishing, 2005), edited by Joel A.C. Baum, 498.
44. Gary A. Klein, *Seeing What Others Don’t: The Remarkable Way We Gain Insights* (New York: Public Affairs, 2013), 151.
45. Klein, *Seeing What Others Don’t*, 153.
46. Ariely, *Predictably Irrational*, 231–238.
47. Nelson and Stolterman, *The Design Way*, 66–67.
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50. Greg Brougham. *The Cynefin Mini-Book: An Introduction to Complexity and the Cynefin Framework* (Middletown: InfoQ.com, 2015).
51. Kurtz and Snowden, “The New Dynamics of Strategy,” 468.
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56. Kurtz and Snowden, “The New Dynamics of Strategy,” 469; Brougham, *Cynefin*, 7; Williams and Hummelbrunner, *Systems Concepts*, 167–168.

57. Brougham, *Cynefin*, 30, 42–44; Williams and Hummelbrunner, *Systems Concepts*, 175–176; Kurtz and Snowden, “The New Dynamics of Strategy,” 465.
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61. Paul Cairney, “Complexity Theory in Political Science and Public Policy,” *Political Studies Review* 10, (2012): 347–348.
62. For an excellent overview of all noted points, see Göktug Morçöl, *A New Mind for Policy Analysis: Toward a Post-Newtonian and Postpositivist Epistemology and Methodology* (Wesport: Praeger Publishers, 2002), 11–25.
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68. Khisty, “Abductive Inferencing,” 104–105.
69. Horst W.J. Rittel and Melvin M. Webber, “Dilemmas in a General Theory of Planning.” *Policy Sciences* 4 (1973): 155–169; Andrejs Skaburskis, “The Origin of ‘Wicked Problems,’” *Planning Theory & Practice* 9, no. 2 (2008): 277–280.
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71. Rittel and Webber, “Dilemmas,” 160.
72. Buckley, Schwandt, and Goldstein, “Society,” 89.
73. *Ibid.*, 89; Bousquet and Curtis. “Beyond Models,” 47; Peter Winch, *The Idea of a Social Science and its Relation to Philosophy, Second Edition* (London: Routledge, 1990), 91.

74. Victoria Chick and Sheila Dow, "The Meaning of Open Systems," *Journal of Economic Methodology*, 12, no. 3 (2005): 367.
75. The debate extends back to the early years of social science, and continues to this day. Insightful and accessible attempts to reconcile the perspectives can be found with Peter L. Berger and Thomas Luckmann, *The Social Construction of Reality: A Treatise in the Sociology of Knowledge* (New York: Anchor Books, 1967) and Anthony Giddens, *The Constitution of Society: Outline of the Theory of Structuration* (Berkeley: University of California Press, 1986). For an excellent overview from the International Relations perspective, see Colin Wight, *Agents, Structures and International Relations* (New York: Cambridge University Press, 2006), 62–72.
76. Herbert A. Simon, *Models of Man* (New York: Wiley, 1957); Khisty, "Abductive Inferencing," 105; Herbert A. Simon, *Reason in Human Affairs* (Stanford: Stanford University Press, 1983), 85.
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79. For example, the Congressional Budget Office (CBO) supports the U.S. Congress's budget process by providing detailed statistical analysis and estimates. Yet even the CBO recognizes that the vagaries of politics make its predictions tentative at best, but it still goes through the motions. See <https://www.cbo.gov/about/processes#methodology>. A Department of Defense variant of the same theme can be found with the Human Social Cultural Behavior Sciences initiative, which is heavily rooted in computational modeling for predictive analysis. See <https://www.onr.navy.mil/en/Media-Center/Fact-Sheets/Human-Social-Cultural-Behavior>.
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82. *Ibid.*, 36–37.
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85. *Ibid.*, 122.
86. *Ibid.*, 133.
87. *Ibid.*, 111–135.
88. The belief that society's variables can be known and revealed over time—at least to the degree of recognizing and predicting trends—dates back to the eighteenth and nineteenth centuries. See, for example, Winch, *The Idea of a Social Science*, 67–69.
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92. Kiel, "Lessons," 431.
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95. David Hume and John Stuart Mills feature prominently in this regard (see Winch, *The Idea of a Social Science*). Others, notably Auguste Comte believed so fervently in this perspective he created his own cult built on the faith of scientific prediction (see "Comte, Isidore Auguste Marie François Xavier," and "Positivism," *The Oxford Companion to Philosophy*, 153, 742–743).
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98. Geyer and Rihani, *Complexity and Public Policy*, 24–25.
99. Winch, *The Idea of a Social Science*, 1–3, 72; Morçöl, *A New Mind for Policy Analysis*, 65–77; Geyer and Rihani, *Complexity and Public Policy*, 13–24.
100. For example, King, Keohane, and Verba acknowledge in their widely used research primer the limits of causal inference in social sciences, but still advocate for the structured application of scientific research methods. Gary King, Robert Keohane, and Sidney Verba, *Designing Social Inquiry: Scientific Inference in Qualitative Research* (Princeton: Princeton University Press, 1994), 6–7. See also Neil E. Harrison, "Thinking About the World We Make," *Complexity in World Politics: Concepts and Methods of a New Paradigm*, Neil E. Harrison, ed. (Albany: State University of New York Press, 2006), 12.
101. Barton, Stephens, and Haslett. "Action Research," 478; Geyer and Rihani, *Complexity and Public Policy*, 13–14.
102. Morçöl, *A New Mind for Policy Analysis*, 11.
103. Cairney, "Complexity Theory," 352.
104. Barton, Stephens, and Haslett. "Action Research," 478.
105. *Ibid.*, 484.
106. King, Keohane, and Verba, *Designing Social Inquiry*, 7.
107. *Ibid.*, 79.
108. *Ibid.*, 6.

109. Ibid., 10; Winch, *The Idea of a Social Science*, 83–86.
110. King, Keohane, and Verba, *Designing Social Inquiry*, 43.
111. Winch, *The Idea of a Social Science*, 85–86.
112. Bethany McLean and Joe Nocera, *All the Devils are Here: The Hidden History of the Financial Crisis* (New York: Penguin, 2011), 52–58; The Financial Crisis Inquiry Report, Financial Crisis Inquiry Commission (Washington, D.C.: Government Printing Office, 2011), 44. The FCIC writes: “The increasing dependence on mathematics let the quants create more complex products and let their managers say, and maybe even believe, that they could better manage those products’ risk ... These models purported to predict with at least 95% certainty how much a firm could lose if market prices changed. But models relied on assumptions based on limited historical data; for mortgage-backed securities, the models would turn out to be woefully inadequate. And modeling human behavior was different from the problems the quants had addressed in graduate school. ‘It’s not like trying to shoot a rocket to the moon where you know the law of gravity,’ Emanuel Derman, a Columbia University finance professor who worked at Goldman Sachs for 17 years, told the Commission. ‘The way people feel about gravity on a given day isn’t going to affect the way the rocket behaves.’”
113. *The Financial Crisis Inquiry Report*, 423.
114. Ibid., 102.
115. Timothy Howard, *The Mortgage Wars: Inside Fannie Mae, Big-Money Politics, and the Collapse of the American Dream* (New York: McGraw-Hill Education, 2014), 65–68.
116. McLean and Nocera, *All the Devils Are Here*, 18–19, 46.
117. *The Financial Crisis Inquiry Report*, 68–72.
118. Ibid., 43–51.
119. McLean and Nocera, *All the Devils Are Here*, 285–291, 296–297; The Financial Crisis Inquiry Report, 118–122. The FCIC notes, “Moody’s did not, however, sufficiently account for the deteriorating quality of the loans being securitized. Fons described this problem to the FCIC: ‘I sat on this high level Structured Credit committee, which you’d think would be dealing with such issues [of declining mortgage-underwriting standards], and never once was it raised to this group or put on our agenda that the decline in quality that was going into pools, the impact possibly on ratings, other things ... We talked about everything but, you know, the elephant sitting on the table.’”
120. *The Financial Crisis Inquiry Report*, 50, 65, 123; McLean and Nocera, *All the Devils Are Here*, 342–357.
121. Joel B. Pollak and Larry Schweikart, *How Trump Won: The Inside Story of a Revolution* (Washington, D.C.: Regnery Publishing, 2017), 11, 198.
122. Pollak and Schweikart, *How Trump Won*, 33–43.
123. Ibid., 2–3, 192–193.

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126. Emilian Kavalski, "The Fifth Debate and the Emergence of Complex International Relations Theory: Notes on the Application of Complexity Theory to the Study of International Life," *Cambridge Review of International Affairs* 20, no. 3 (2007): 436.
127. Williams and Hummelbrunner, *Systems Concepts*, 3.
128. Kuhn, *Structure*, 37.
129. Morçöl, "A New Systems Thinking," 309.
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131. McChrystal et al, *Team of Teams*, 20.
132. *Ibid.*, 230.
133. Morçöl, "A New Systems Thinking," 314.
134. *Ibid.*, 314.
135. Some international relations scholars actually describe the Cold War era as the aberration in history. Kavalski, "The Fifth Debate," 443. See also Harrison, "Thinking About the World We Make," 1.
136. Kavalski, "The Fifth Debate," 435.
137. *Ibid.*
138. Graham Taylor, *The New Political Sociology: Power, Ideology and Identity in an Age of Complexity* (New York: Palgrave Macmillan, 2010), 120.
139. Reuben Ablowitz with Jeffrey Goldstein, "The Theory of Emergence." *E:CO* 12, no. 3, (2010), 140–141.
140. Ablowitz and Goldstein, "Emergence," 142.
141. *Ibid.*, 143.
142. Kari Theurer, "Complexity-Based Theories of Emergence: Criticisms and Constraints." *International Studies in the Philosophy of Science* 28, no. 3 (2014): 280.
143. Buckley, Schwandt, and Goldstein, "Society," 90.
144. *Ibid.*, 91.
145. *Ibid.*, 92.
146. *Ibid.*
147. *Ibid.*
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150. Herbert Simon with Paul Cillers, "The Architecture of Complexity." eds. Kurt A. Richardson, David Snowden, Peter M. Allen, and Jeffrey A. Goldstein, (Mansfield: ISCE Publishing, 2006), 502–507.
151. Buckley, Schwandt, and Goldstein, "Society," 93.
152. Colanders and Kupers, *Complexity*, 54, 119–120.
153. Buckley, Schwandt, and Goldstein, "Society," 93.
154. *Ibid.*, 94.
155. Agent-based modeling often refers to individuals as "cells" and utilize rule matrices to demonstrate potential emergent patterns. See Ruth Lane, *The Complexity of Self Government: Politics from the Bottom Up* (New York: Cambridge University Press, 2017), 42.
156. Kiel, "Lessons," 436.
157. *Joint Publication 5-0*, III-22–25.
158. Nassim Nicholas Taleb, *Antifragile: Things that Gain from Disorder* (New York: Random House Trade Paperbacks, 2014), 134–137.
159. Jacque Wilson, "Viagra: The Little Blue Pill that Could," *www.cnn.com*, 27 March 2013, accessed 5 May 2017, <http://www.cnn.com/2013/03/27/health/viagra-anniversary-timeline/>.
160. Kiel, "Lessons," 437.
161. Morçöl, *A New Mind for Policy Analysis*, 246–252.
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170. Morçöl, *A New Mind for Policy Analysis*, 25.
171. Kavalski, "The Fifth Debate," 437.
172. Winch, *The Idea of a Social Science*, 86.
173. Kuhn, *Structure*, 109.
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176. Colin Wight, *Agents, Structures and International Relations* (New York: Cambridge University Press, 2006), 224; Harrison, "Thinking About the World We Make," 7.
177. "Growth in United Nations membership, 1945-present," *United Nations*, accessed 10 July 2017, <http://www.un.org/en/sections/member-states/growth-united-nations-membership-1945-present/index.html>.
178. Harrison, "Thinking About the World We Make," 7.
179. *Ibid.*, 8-9.
180. Wight, *Agents*, 222.
181. Buckley, Schwandt, and Goldstein, "Society," 93.
182. Harrison, "Thinking About the World We Make," 9.
183. Buckley, Schwandt, and Goldstein, "Society," 96.
184. Harrison, "Thinking About the World We Make," 5.
185. Kiel, "Lessons," 437.
186. Lane, *The Complexity of Self Government*, 22.
187. Wight, *Agents*, 219. Wight describes the systems of systems: "A state can be considered a structuratum constituted of many structured organisational entities and institutions, which are themselves structured in certain ways. That is to say that the organisations and institutions which (in part) constitute the state stand in complex relations, hence are structured into a certain form. The entities that stand in these relations are ontologically varied and encompass both material and social aspects of existence. Hence one could identify economic organisations and institutions, political organisations and institutions, ideological organisations and institutions, cultural organisations and institutions, and so on."
188. Lane, *The Complexity of Self Government*, 13.
189. *Ibid.*, 52.
190. Charles Kadushin, *Understanding Social Networks: Theories, Concepts, and Findings* (New York: Oxford University Press, 2012), 91.
191. Lane, *The Complexity of Self Government*, 62.
192. Buckley, Schwandt, and Goldstein, "Society," 96.
193. Colanders and Kupers, *Complexity*, 24.
194. Cairney, "Complexity Theory," 352.
195. Wight, *Agents*, 224.
196. Kadushin, *Understanding Social Networks*, 106.
197. Colanders and Kupers, *Complexity*, 58.
198. *Ibid.*, 53.
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216. *Ibid.*, 7.
217. *Ibid.*, 41.
218. Colanders and Kupers, *Complexity*, 48.
219. *Ibid.*, 46.
220. *Ibid.*, 28.
221. *Ibid.*, 49.
222. Harrison, "Thinking About the World We Make," 11.
223. Morçöl, *A New Mind for Policy Analysis*, 177.
224. Colanders and Kupers, *Complexity*, 49.
225. *Ibid.*, 26–27.
226. *Ibid.*, 48.
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228. Benedict Anderson, *Imagined Communities* (New York: Verso, 1991), 4–5.
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231. Anderson, *Imagined Communities*, 11–12.
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233. *Ibid.*, 33–46.
234. Kadushin, *Understanding Social Networks*, 18.
235. *Ibid.*, 18–20.
236. Khanna, *Connectography*, 44; Valentine Moghadam, *Globalization and Social Movements: Islamism, Feminism, and the Global Justice Movement* (Rowman & Littlefield Publishers, Inc.: Lanham, 2013), 208.
237. Khanna, *Connectography*, 30–31.; Moghadam, *Globalization and Social Movements*, 8–11.
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240. Ed Husain, *The Islamist: Why I Joined Radical Islam in Britain, What I Saw Inside and Why I Left* (New York: Penguin Books, 2007), 142, 277.
241. Manuel De Landa, *A Thousand Years of Nonlinear History* (New York: Zone Books, 1997), 14.
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248. *Ibid.*, xvi–xvii.
249. *Ibid.*, xvii, 21.
250. *Ibid.*, 28.
251. *Ibid.*, 49–51.
252. *Ibid.*, xvi, xvii.
253. *Ibid.*, xxii.
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256. *Ibid.*, xxiv.

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