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DIRECTORATE OF INTELLIGENCE

Anticipating Strategic-Level Surprise

(b)(3)

JANUARY 2013

CIA-DI-12-01775

ANALYTIC FRAMEWORKS FOR PRACTICAL USE

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Key Findings (b)(3)

(b)(3) Anticipating strategic-level surprises—the sudden outbreaks of wars, revolutions, genocides, or economic calamities that affect core US interests—remains the hardest task for Intelligence Community (IC) analysts. Such surprises can include sudden hostile actions targeted at the United States or its allies, as well as unexpected developments—such as the sudden fall of a government—that are not aimed at the United States but that directly or indirectly affect US interests, for good or ill. A review of the many strategic-level surprises that have befallen all the major powers since the onset of World War II indicates recurring patterns of surprise, including in the following areas:

- (b)(3) The three types of events that tend to surprise us.
- (b)(3) The barriers to early perception and warning of these various types of surprise.
- (b)(3) The approaches and tools that can assist early recognition and warning of looming surprises (see figure 1).

(b)(3) ***Type I. Sudden Hostile Action.*** This type of surprise involves abrupt, deliberate action by a unified actor—an armed force, a state, a terrorist cell, or a radical group—intended to disorient, defeat, or destroy an unprepared opponent. Typically concentrated in space and time, subtypes of such actions include surprise attacks, coups, diplomatic surprises, strategic power plays, military-technological surprises, or the initiation or escalation of major human rights abuses.

(b)(3) ***Type II. System Shock.*** This type of surprise involves the abrupt failure or transformation of a complex system or set of systems, such as a state, an empire, an economy, or an international organization or alliance. The action in system shock can occur in weeks, months, or years, but it still represents a dramatic acceleration in the rate of change from the previous status quo. Type II surprises are the result of human actions but not the result of a master plan executed by any one controlling actor. Subtypes of such shocks include the popular overthrow of a ruler, the failure of a state, the onset of a genuine revolution, a deep recession or hyperinflation, the breakdown of an alliance or international body, or the outbreak of widespread communal violence.

(b)(3) ***Type III. Tectonic Transformation.*** This type of surprise often includes sweeping nonlinear changes to an entire domain or region, such as a continental economy or a regional military balance. Unlike the first two types of surprise, it does not involve sudden, obvious change but rather large-scale, cumulative evolutionary changes that transform with gathering momentum the entire domain over a period of years or decades—along with the strategic, political, and economic systems therein. Subtypes include industrial and technological revolutions, the rise of new powers, the birth of new ideological and social movements or the transformation of existing ones, or revolutions in military affairs.

- (b)(3) These transformations disrupt the status quo, force leaders and institutions to respond, punish maladaptive systems, and often lead to further discontinuities of all types.

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Some barriers to early recognition of looming dangers are internal to intelligence agencies. These barriers include: (b)(3)

- IC organizational barriers to information sharing and learning; pressures for group consensus and "clean story lines," which tend to limit discussion of nonlinear or unlikely outcomes; analysts' mind-sets, biases, and cognitive limits, which weaken their ability to anticipate discontinuous changes; and a reluctance to warn for fear of crying wolf, of being wrong, of upsetting the group consensus, or of riling superiors. (b)(3)

The following approaches, tools, and concepts may help analysts to surmount the barriers to early recognition and warning of looming discontinuities, even in cases where actionable intelligence reporting is wanting. (b)(3)

- These methods are intended to supplement—not replace—substantive expertise and sound tradecraft. Indeed, they will work most effectively when employed by teams of analytic experts. (b)(3)

Sudden Hostile Action. Analysts can better anticipate sudden hostile action by familiarizing themselves with the strategic patterns that tend to be more conducive to surprise and by rigorously examining the incentives and motivations for would-be hostile actors, including by: (b)(3)

- dentifying historical patterns of sudden hostile action drawn from case studies of precedents that may be analogous to current strategic circumstances in some significant aspects. (b)(3)
- Evaluating how closely current situations align with the preconditions for surprise identified in scholarly literature on intelligence and strategic surprise. (b)(3)
- Getting into the heads of would-be hostile actors to assess their calculus for considering surprise in analytically sophisticated ways that avoid mirror imaging, rational actor assumptions, or caricatures. (b)(3)
- Conducting simulations, war games, and exercises to identify possible situational incentives and pressures on adversaries to strike suddenly. (b)(3)
- Monitoring the rhetoric and vocabulary of foreign actors for signs that they are losing patience with the status quo, heralding their readiness for drastic remedies, or mobilizing followers to prepare them for sacrifice and violence. (b)(3)
-) Brainstorming the vulnerabilities of would-be victims of sudden hostile action, via such methods as intelligence premortems and defensive casing—critically surveying one's own defenses to assess blue force weak points, critical targets, and readiness. (b)(3)

System Shock. IC analysts can supplement intelligence reporting on the systems and networks that they are responsible for—states, alliances, insurgencies, or economies—with concepts and approaches that bolster anticipation of the possibilities for rapid, discontinuous change, including by: (b)(3)

- Assessing the strengths and vulnerabilities of an entire system to better anticipate system shifts and tipping points; applying some basic concepts from the study of complex adaptive systems—including feedback loops, emergence, herd behavior, nonlinearity, or butterfly effects—can help. (b)(3)
- Employing far-domain analogies from the realms of science, medicine, and engineering—phase transitions, critical mass, contagion, perfect storm, brittleness, or "normal accidents"—to help conceptualize sudden, dramatic departures from a seemingly stable equilibrium in the domains of national security and economic affairs. (b)(3)
- Widening the range of imaginable outcomes via well-crafted scenarios, alternative futures, or simulations can help analysts avoid single-point predictions—the bane of sound strategic foresight. (b)(3)

[redacted] ***Tectonic Transformation.*** Tectonic transformation involves such long-term, large-scale changes that traditional intelligence sources are of even less use than they are in anticipating system shocks. Instead, the following techniques can help analysts dispel the "poverty of imagination": (b)(3)

- [redacted] Adopting multiframe perspectives via outside opinions, nonmainstream thinking, or new sources of data and information can provide insights besides those circulating in the usual intelligence channels, challenge the conventional wisdom, and test mainstream hypotheses. (b)(3)
- [redacted] Brainstorming the core drivers or signature technologies of national, regional, or global systems and their variegated effects on other domains with a diverse group of experts across disciplines can help analysts expand the range of imaginable scenarios and boost their anticipation of transformational changes on a large-scale. (b)(3)

[redacted] ***Aids To Anticipating All Types of Discontinuities.*** For all types of looming surprise, IC analysts should scrutinize anomalous events, outlier data, and incongruous information. The initial clues of impending discontinuities—analogous to the preshocks of an earthquake—are often isolated, irregular, and ragged, but they deserve extra attention. Hunches prompted by anomalous data can be valuable prods for reexamining baseline assessments. (b)(3)

- [redacted] If done on a regular basis, stability audits—analytic surveys designed to spur respondents' thinking about evolving system dynamics, possible surprises, existing assumptions, and key information gaps—can expose the weaknesses of once-stable systems and the breakdown of old analytic paradigms over time. (b)(3)
- [redacted] Intelligence premortems—which postulate that an existing analytic line is wrong—can also help the IC prevent premature closure, go beyond straight line extrapolations, and brainstorm hypotheses that could better explain new or discrepant data. (b)(3)
- [redacted] Integrating analysis of possible discontinuities into mainline analysis can help IC products to address a wider range of possible outcomes. (b)(3)

/FOUO) Type I. Sudden Hostile Action	(U//FOUO) Type II. System Shock	(U//FOUO) Type III. T
ate action by an adversary (such as a state, armed force, or ıst an unprepared target	*Abrupt failure or transformation of a complex system or set of systems (such as a state, empire, or economy)*	*Sweeping changes in regional o system, ideologies and religions, so*
ın Pearl Harbor in 1941 ɔn Israel in the 1973 Arab-Israeli war 11 September 2001	• Fall of the Shah of Iran in 1978-79 • Collapse of communism in Eastern Europe and Soviet Union in 1989-91 • Ouster of Egyptian President Hosni Mubarak in 2011	•) China's economic transformatic •) Growth of civil rights, human r •) Rise of the World Wide Web, Ir •) Emergence of political Islam
·ate, hostile deed by a unified actor (such as a state, armed force, utionary vanguard party) aimed at disorienting, defeating, or ɔared opponent	Rapid transformation of a complex system or systems—a state, economy, or international organization—or the rapid failure of a maladaptive system (an empire, an alliance, or a war effort)	•) Extensive long-term changes, fu economic systems, demographic pa often culminating in an epiphany, significance of change
ıy, such as the Soviet Union's blockade of Berlin from land 1948 or its emplacement of offensive weapons in Cuba in 1962 ise, such as Egyptian President Anwar Sadat's ouster of Soviet 1972 or his visit to Israel in 1977 ation tion of mass human rights abuses	• Ouster of a longtime political ruler • Revolution • Outbreak of civil war or secessionist movement • Outburst of communal violence • Depression • Supply shock, such as the OPEC oil embargo of 1973-74 • Financial panics and hyperinflations	• Industrial revolutions • Economic transformations • Emergence of new powers, dec • Rise or fundamental changes belief systems, such as Marxism-I • Growth of social movements
enial (secrecy, security, stealth) and deception by an e foe fallacious rational actor assumptions of actor's commitment, risk-tolerance, or bias toward action ılation	• System complexity, chaos, and randomness • Inherent unpredictability of the tipping points that lead to nonlinear changes—the butterfly effect • Observer's tendency to make straight line extrapolations • Difficulty of timing the onset of a system shock	• The widely distributed nature plain sight • The large scale of change—im • Scope, dimensions of change-
assess warning indicators on regular basis am/forensic assessments of actor's means, motives, and ɔmmit a sudden hostile act ıg and premortems of imaginable surprise: assess weaknesses, ystems that may invite opportunistic attacks s level of political commitment, especially an all-out effort to ; assess strategic red lines ıtegic stability audits	•) Apply complex systems analysis, focusing on identifying feedback loops, possible triggers, or catalysts for change •) Brainstorm possible "black swans"—wild cards that would impose system shifts • Foster acute sensitivity to anomalous occurrences, data outliers, incongruities; anticipate inflection points • Anticipate predictable surprises—crises caused by system unresponsive to identifiable problems, such as growing debts and deficits or to deteriorati environmental conditions • Employ far-domain analogies—such as phase transitions, avalanches, or earthquakes—to examine possible tipping points	• Examine core system drivers, ic their effects with wide network of i •) Consider analogous historic pre concepts of Richard Neustadt and I •) Apply most relevant far-domair engineering, such as tectonic chang • Generate scenarios to expand th • Apply concepts of systems thinl Fukuyama, Samuel Huntington), ec Joseph Schumpeter) and strategy (I Howard, John Keegan, Paul Kenne

tectonic change—technological or military innovation, economic

Source: Based on a review by a senior CIA analyst of more than two dozen cases of intelligence surprise

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(U//FOUO) Figure 1

A Typology of Surprise

	(U//FOUO) Type I. Sudden Hostile Action	(U//FOUO) Type II. System Shock	(U//FOUO) Type III. Tectonic Transformation[a]
	Abrupt, deliberate action by an adversary (such as a state, armed force, or terrorist cell) against an unprepared target	*Abrupt failure or transformation of a complex system or set of systems (such as a state, empire, or economy)*	*Sweeping changes in regional or global domains (such as an interstate system, ideologies and religions, societal mores, technology, or economy)*
Archetypes	• Japan's attack on Pearl Harbor in 1941 • Egypt's attack on Israel in the 1973 Arab-Israeli war • The attacks of 11 September 2001	• Fall of the Shah of Iran in 1978-79 • Collapse of communism in Eastern Europe and Soviet Union in 1989-91 • Ouster of Egyptian President Hosni Mubarak in 2011	• China's economic transformation since late 1970s • Growth of civil rights, human rights movements • Rise of the World Wide Web, Internet, surge of social media • Emergence of political Islam
Essence	• Abrupt, deliberate, hostile deed by a unified actor (such as a state, armed force, terrorist cell, revolutionary vanguard party) aimed at disorienting, defeating, or destroying an unprepared opponent	• Rapid transformation of a complex system or systems—a state, economy, or international organization—or the rapid failure of a maladaptive system (an empire, an alliance, or a war effort)	• Extensive long-term changes, fundamental alterations of core technologies, economic systems, demographic patterns, political allegiances, or ideologies—often culminating in an epiphany, an event that exposes the sweeping scale, significance of change
Subtypes	• Surprise attack • Abrupt power play, such as the Soviet Union's blockade of Berlin from land communications in 1948 or its emplacement of offensive weapons in Cuba in 196 • Coups • Diplomatic surprise, such as Egyptian President Anwar Sadat's ouster of Sov military advisers in 1972 or his visit to Israel in 1977 • Political assassination • Initiation, escalation of mass human rights abuses	• Ouster of a longtime political ruler • Revolution • Outbreak of civil war or secessionist movement • Outburst of communal violence • Depression • Supply shock, such as the OPEC oil embargo of 1973-74 • Financial panics and hyperinflations	• Industrial revolutions • Economic transformations • Emergence of new powers, decline of old ones • Rise or fundamental changes of political ideologies, religions; decay of old belief systems, such as Marxism-Leninism • Growth of social movements
Barriers to Perception	• Effective use of denial (secrecy, security, stealth) and deception by an improvising, adaptive foe • Mirror-imaging; fallacious rational actor assumptions • Underestimation of actor's commitment, risk-tolerance, or bias toward action • Failure of imagination	• System complexity, chaos, and randomness • Inherent unpredictability of the tipping points that lead to nonlinear changes—the butterfly effect • Observer's tendency to make straight line extrapolations • Difficulty of timing the onset of a system shock	• The widely distributed nature of bottom-up change that is hidden in plain sight • The large scale of change—impossible for an observer to monitor in entirety • Scope, dimensions of change—too diverse, contingent to forecast accurately
Analytic Concepts/ Approaches	• Monitor and reassess warning indicators on regular basis • Conduct red team/forensic assessments of actor's means, motives, and opportunities to commit a sudden hostile act • Defensive casing and premortems of imaginable surprise: assess weaknesses, vulnerabilities in systems that may invite opportunistic attacks • Measure actor's level of political commitment, especially an all-out effort to bolster capabilities; assess strategic red lines • Do regular strategic stability audits	• Apply complex systems analysis, focusing on identifying feedback loops, possible triggers, or catalysts for change • Brainstorm possible "black swans"—wild cards that would impose system shifts • Foster acute sensitivity to anomalous occurrences, data outliers, incongruities; anticipate inflection points • Anticipate predictable surprises—crises caused by system unresponsiveness to identifiable problems, such as growing debts and deficits or to deteriorating environmental conditions • Employ far-domain analogies—such as phase transitions, avalanches, or earthquakes—to examine possible tipping points	• Examine core system drivers, identify signature technologies; brainstorm their effects with wide network of interdisciplinary experts • Consider analogous historic precedents—employ "Thinking in Time" concepts of Richard Neustadt and Ernest May • Apply most relevant far-domain analogies from science, medicine, or engineering, such as tectonic change, evolution • Generate scenarios to expand the range of imaginable future outcomes • Apply concepts of systems thinkers in politics (for example, Francis Fukuyama, Samuel Huntington), economics (David Landes, Douglass North, Joseph Schumpeter) and strategy (Robert Jervis, Thomas Schelling, Michael Howard, John Keegan, Paul Kennedy)

[a] In most instances, the driver(s) of tectonic change—technological or military innovation, economic expansion, and the rise of new powers or ideologies—will be widely known. However, the scale of the change and its effects on states, organizations, and societies will not be comprehended because the consequences are so widely distributed and their ramifications for strategy and politics are not understood or anticipated.

Source: Based on a review by a senior CIA analyst of more than two dozen cases of intelligence s e experienced by US, British, French, Israeli, and Soviet services between 1939 and 2010.

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Scope Note

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(b)(3) The purpose of this training aid is to help IC analysts better anticipate major discontinuities, including surprise attacks, political upheavals, major economic dislocations, and mass human rights abuses. It assumes that clear, timely and actionable intelligence reporting before future discontinuities will—as in historical cases—remain the exception, rather than the rule, and that IC analytic teams will therefore need to supplement empirically based intelligence analysis with a variety of techniques to boost analytic anticipation of looming dangers.

(b)(3) This training aid seeks to help analysts understand:

- (b)(3) The nature and properties of real-world discontinuities.
- The many cognitive and organizational barriers to strategic foresight and warning of looming discontinuities.
- (b)(3) Methods to enhance early recognition of looming discontinuities.

(b)(3) The concepts offered in this training aid were drawn from a sabbatical on intelligence surprise undertaken in 2010 by a senior analyst in the Regional Dynamics Program, the tradecraft cell of the Office of Russia and Eurasian Analysis in CIA's Directorate of Intelligence. The analyst conducted an in-depth study of more than two dozen cases of intelligence surprise affecting all the great powers since the onset of World War II across all domains—strategic, diplomatic, political, economic and technological. The author also reviewed many of the keystone academic studies of intelligence surprise published since the appearance in 1962 of Roberta Wohlstetter's classic work, *Pearl Harbor: Warning and Decision,* which ushered in the modern field of intelligence studies.

(b)(3) This training aid focuses on practical applications and tools that analysts, working alone or in small teams, can employ to better anticipate discontinuities, particularly in cases where accurate, timely reporting on warning indicators is scarce. It does not address quantitative models that can help predict the likelihood of outlier outcomes. It is unclassified to broaden its availability.

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Introduction

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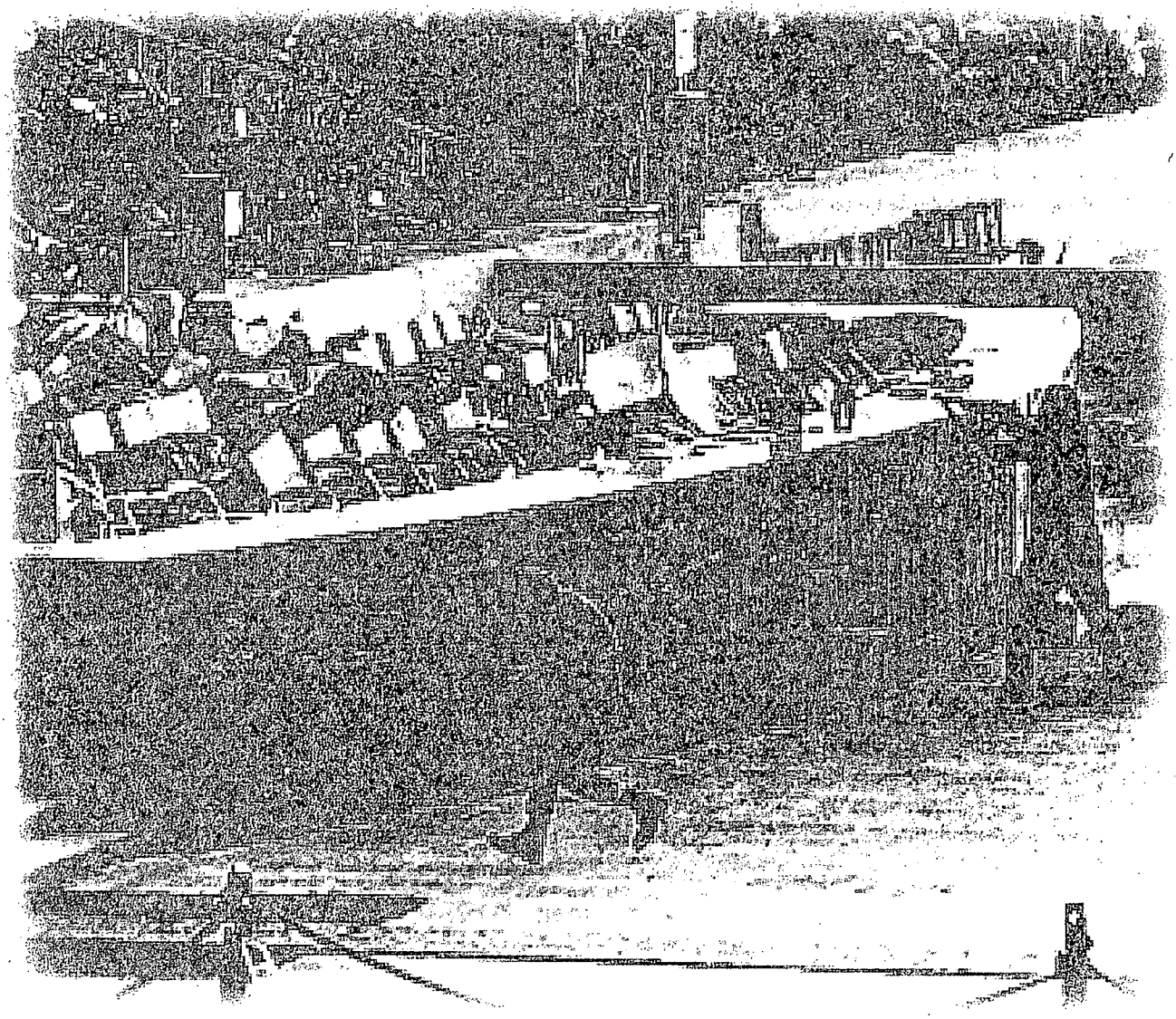

Gunmen of the Egyptian Islamic Jihad fire into the reviewing stand, killing Egyptian President Anwar Sadat and 11 other Egyptian and foreign officials and wounding 28 more during a military parade on 6 October 1981.

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Anticipating Strategic-Level Surprise: Analytic Frameworks for Practical Use

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Anticipating major discontinuities—sudden outbreaks of wars, surprise attacks, revolutions, genocides, diplomatic reversals, or economic calamities—remains the hardest job for Intelligence Community (IC) analysts. Historically, the inability of collectors and analysts to persuasively warn of looming dangers has been the precondition for most cases of intelligence surprise.

The purpose of this training aid is to help IC analysts in the trenches to anticipate discontinuities and thereby reduce the risks of future surprises and intelligence failures.

- The paper begins with a discussion of the numerous barriers to analytic perception and warning of major discontinuities.
- It then offers a typology of intelligence surprise, discusses three key classes of surprise in depth, and suggests ways for IC analysts and managers to anticipate surprise.

Introduction: Anticipating Discontinuities—Why It Is Hard

Major discontinuities in any one domain or geographic region are rare events. Even dynamic open systems—the global balance of power, a regional economy, or a political order—will usually exhibit considerable continuity, inertia, and only incremental changes over the short and medium terms. As a result, most analytic accounts on a day-to-day basis will exhibit a fair amount of orderliness, predictability, and only modest, incremental change. Analysts seeking a baseline understanding of their account will often treat these "typical" periods as ones of "normalcy."

- These periods of normalcy, which may have begun long before an analyst started following an account, will often habituate analysts to see what they expect to see—continued normalcy, defined as gradual incremental changes in their areas of responsibility. This tendency to expect the status quo in the near and medium terms is compounded by cognitive habits. Experiments from cognitive psychologists suggest that most people have a deep-seated need to perceive the world as orderly, comprehensible, and predictable. (b)(3)
- Moreover, evidence of impending discontinuities is usually sparse and in some cases never appears at all. Even if such evidence is received, it usually appears noteworthy only in hindsight. Before the event, such clues—if they are observed at all—tend to be obscure, irregularly timed, and inconsistent with or even contradictory to most of the other incoming data. Such clues often come as "weak signals" and are hard to discern from the other "noise" that overwhelms most analytic systems. (b)(3)
- As a result of these tendencies, analysts may not be in the appropriate analytic posture for recognizing or reacting when their account or issue is at increasing risk of a "phase transition"—a rapid shift from peace to war, stability to instability, order to disorder, popular apathy to public engagement—that is, from predictability to unpredictability. (b)(3)

A Typology of Surprise—An Aid to Early Recognition

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The typology of intelligence surprise discussed in this paper is designed to help intelligence analysts identify looming discontinuities early on. Based on an extensive review of historical cases and academic

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Discontinuity, Surprise, and Warning Definitions

The discussion in this paper refers to a series of related terms.

A **discontinuity** is a rapid increase in the rate, scale, or scope of change—or a sudden shift in its direction—in any country or region or in any field relevant to US national interests. It can include events targeted at US interests as well as events not aimed at the United States but that significantly affect it, such as the sudden onset of instability in the Arab world in 2011 or the collapse of the Soviet bloc beginning in 1989. Examples of discontinuities include the following:

- A surprise attack on the US Homeland or on US forces or targets at home or abroad.
- The sudden departure from power of a key national leader or collapse of a government for any reason.
- The outbreak or sudden escalation of widespread human rights abuses or a genocide campaign.

Surprise is the jolt that an analyst, an intelligence service, or an unprepared government experiences in the face of unexpected, often dangerous, new developments that confound one's assumptions, expectations, and strategy. Examples of the jarring disorientation that can ensue as a result of a discontinuity include the following:

- The surprise attacks on France, the Soviet Union, and the United States early in World War II and al-Qa'ida's attacks on US targets, starting in 1998.
- The fall of the Shah of Iran in 1978-79 and the swift ousters in 2011 of President Ben Ali from Tunisia and President Hosni Mubarak from Egypt.
- The onset of the global financial crisis—with all its attendant effects on politics, society, and strategic events worldwide—starting in 2008.

Surprise can be positive if the discontinuity is beneficial to US interests, as was the collapse of communist rule in Eastern Europe and the Soviet Union. However, even if the event is favorable to US interests, lack of advanced notification from the IC is still a bad outcome because it leaves US policymakers less prepared to take advantage of opportunities than they would have been if they had been expecting it.

Warning—a core IC mission—is the clear, convincing, accurate, and timely notification of policymakers of a threatening or potentially dangerous development. Persuasive strategic warning convinces policymakers of the existence and gravity of the looming event. Timely warning gives policymakers the opportunity to deliberate on the issue, decide on a course of action, and implement it in time to avert the danger or—should it occur anyway—to mitigate the damage to US interests.

An **intelligence failure** is the label often given to episodes in which the IC did not provide policymakers with adequate warning of events—often discontinuities—that gravely damaged US interests. Examples include the Pearl Harbor attack in 1941; the USSR's detonation of an atomic bomb in 1949, five years before CIA weapons analysts estimated that it was possible; North Korea's invasion of South Korea and communist China's intervention in the Korean war in 1950; the outbreaks of the Arab-Israeli wars; the fall of friendly governments in Iraq (1958) and Iran (1978-79); the Warsaw Pact invasion of Czechoslovakia in 1968; the Rwandan genocide in 1994; and the attacks of 11 September 2001.

- In some of these cases, policymakers had, in fact, not received warnings from the IC; in others, policymakers judged that they had not been adequately warned—as then Secretary of State Henry Kissinger publicly claimed after the 1973 Arab-Israeli war—because the warnings that they received were poorly sourced, ambiguous, or not emphasized repeatedly.

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writings, it breaks intelligence surprise into three types, based on the essence and origins of that type of surprise: sudden hostile action, system shock, and the effects of tectonic transformation.

- The goal is to improve analysts' foresight of discontinuities by bolstering understanding of the types, patterns, and diversity of discontinuous change, based on previous historical examples.

Each section's accompanying matrix examines five aspects to each of these surprise types (see appendix A for other ways of classifying surprise).

- Classic examples of that type of discontinuity.
- The essence of that type of discontinuity.
- Various subtypes of that discontinuity.
- Barriers to early perception, which can differ based on the nature of the surprise involved.
- Concrete measures that can help analysts better anticipate discontinuities.

This typology does not imply that there is always a clear division between the various categories of surprise or that they only occur in isolation. In major upheavals, multiple types of surprise are typically in play, making the task of analysis even harder.

Foresight Based on Early Pattern Recognition

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Educating analysts about past patterns of surprise can help them anticipate future discontinuities. The Recognition-Primed Model (RPM) of rapid decisionmaking—first described in the 1980s by behavioral scientist Gary Klein—suggests that humans by default react to new situations by trying to put them in a more familiar context. They do this by recognizing—based on prior experiences and expertise—the similarities between the current situation and past ones with which they are familiar. Critical to this effort is acquiring rapid situational awareness, which can only be based on an expert's sensitivity to relevant cues and expectations about how the situation might evolve, derived from extensive prior experiences with roughly similar but rarely identical problem types. The RPM model suggests that familiarizing analysts with past categories and patterns of surprise can increase the speed with which they recognize emerging crises that could lead to future discontinuities, thereby increasing the odds of early assessment and warning.

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The Overlapping Nature Of Surprise: The Case Of Cuba

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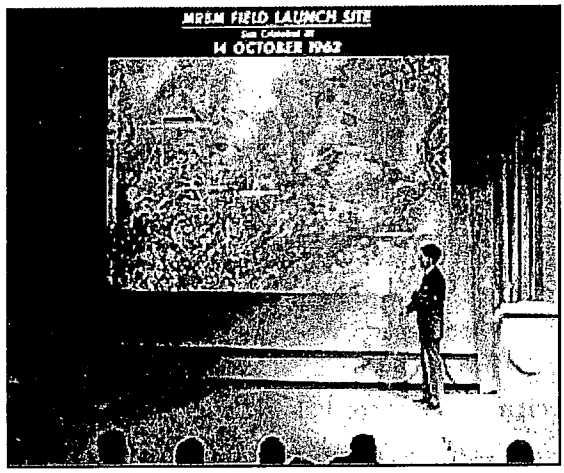
(b)(3) The events leading up to the Cuban Missile Crisis in the fall of 1962 demonstrate the multiple, overlapping dimensions of surprise that frequently precipitate major crises and geopolitical upheavals.

- (b)(3) The long-term changes that created the preconditions for the crisis are all examples of Type III surprises, Tectonic Transformations. They include the rise of the Marxist-Leninist ideology that inspired Nikita Khrushchev and Fidel Castro; the growth of Soviet power in the middle of the 20th century; the onset of the Cold War; the revolutions in physics, engineering, and weaponry that led to the development of ballistic missiles armed with nuclear warheads; and the spread of radical, anti-US nationalism in Cuba and Latin America in the 1950s and early 1960s.
- (b)(3) The rapid crumbling of Fulgencio Batista's dictatorship to a radical insurgent movement under Castro's control in late 1958 was a Type II surprise, System Shock, that reverberated throughout Latin America for decades.
- (b)(3) The Soviet effort to covertly emplace nuclear weapons in Cuba, which escalated into the most dangerous crisis of the Cold War, was a Type I surprise, Sudden Hostile Action—a strategic power play that Soviet leader Khrushchev intended as a fait accompli to spring on the United States and the world as soon as the missiles were operational.



(b)(3) *John T. Hughes of the Defense Intelligence Agency, briefs Secretary of Defense Robert McNamara and reporters in February 1963 on US intelligence on the Soviet deployment of nuclear weapons to Cuba and their subsequent withdrawal in the fall of 1962.*

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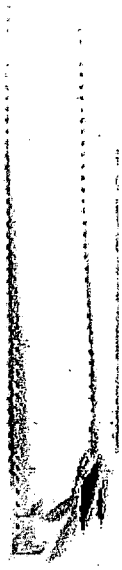

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[redacted] Checklist 1 (b)(3)

A Checklist on Anticipating Discontinuities in My AOR: A 10 + 1 Point Inspection Plan

1 ☐ [redacted] (b)(3)
Motivations and Intentions for Sudden Hostile Action. Who are the extreme alpha actors in my area of responsibility (AOR)? Who are the key leaders who are fixated to the point of obsession on "radical" goals achievable only via extreme measure and who are tolerant of risk? Are their goals achievable only via radical measures? What is the trend in their rhetoric? Is it becoming more extreme or more measured? What is their attitude toward violence or extreme measures? Has it changed? Have they altered their red lines or tightened the deadline for a "resolution"?

2 ☐ [redacted] (b)(3)
Capabilities and Plans for Sudden Hostile Action. Are any actors—states or subnational groups—developing the capacity for sudden hostile action? Do they now possess such capabilities? Are any such actors making a maximal effort to acquire the means for a strategic strike against their enemies? Are there signs or clues that they are undertaking a major denial and deception effort to conceal these efforts?

3 ☐ [redacted] (b)(3)
Escalation Potential. Are there opportunities for sudden hostile action? Are there one or more enduring strategic rivalries or frozen conflicts in my AOR? Is one side growing weaker, more isolated, more belligerent, or more desperate? What is the trend line? Are one or more parties close to breaching the other's strategic red lines? Has a state been weakened by internal factors or foreign pressure in ways that make it vulnerable to surprise attack? How vulnerable are key actors in my AOR? Do they possess single points of strategic failure?

4 ☐ [redacted] (b)(3)
Brittleness of Key "Systems". What are the critical actors—states, organizations, institutions, militaries—in my AOR? How adaptive are they? Are they coping with current problems? Can they cope with added strains, novel problems, or one or more crises? What might be driving my AOR toward System Shock or Tectonic Transformation, or constraining such discontinuities? What are the "normal accidents" waiting to happen—involving maladaptive states, organizations, businesses, militaries—in my AOR?

5 ☐ [redacted] (b)(3)
Phase Transitions and Tipping Points. What might a contagion—ideological, political, or financial—look like in my AOR? How interdependent are the key actors? How strong are transnational influences—media, ideological, commercial—in my AOR? What far-domain analogies—phase transitions, butterfly effects, seismic shifts—from other disciplines might I use to anticipate discontinuous change?

6 ☐ [redacted] (b)(3)
Drivers of Tectonic Transformation. What are the core system drivers, signature technologies, principal ideologies, defining military systems in my AOR? Is my AOR undergoing profound economic, technological, or social changes? Are there multiple tectonic "plates" in my AOR? Are they shifting in divergent or conflicting directions? What previous epochs or eras might my AOR current resemble? How might current times compare or contrast to previous epochs?

[redacted] (b)(3)

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(b)(3)

Checklist 1

Anticipating Discontinuities in My AOR:

A 10 + 1 Point Inspection Plan (Continued)

7 ☐ (b)(3) ***Challenging Status Quo Assumptions.*** How can I compensate for status quo assumptions in my AOR? What tools, approaches can I use to challenge the mind-set that tomorrow will pretty much look like today, that change will be linear, evolutionary? How can I avoid being numbed to the cumulative weight of incremental change?

8 ☐ (b)(3) ***Knowledge Gaps.*** What are the critical variables in my AOR? What are the biggest information gaps regarding them? What can I do now to close those gaps and/or compensate for them? Would I know it if the situation were close to a tipping point, a sudden phase transition from peace to war, stability to instability, state function to failure? Why or why not?

9 ☐ (b)(3) ***The X-Factor.*** What might I be overlooking in my AOR? What is "hidden in plain sight?" What are the possible "black swans"—extreme events outside the realm of expectations, with seismic impacts—that might undo the status quo in my AOR? What are the "rare events" that could come crashing down on my AOR?

10 ☐ (b)(3) ***Warning.*** Are there looming crises or discontinuities that I should warn of now? Do my management chain and IC peers need to be alerted? Should I issue an "intermediate" warning that shines a light on changing system dynamics and increased precrisis tensions in my AOR? Who is the right audience for such a warning? What is the best way to convey a warning? Are there opportunities for deterrent or remedial actions? What sorts of arresting graphics and visualization aids might I employ to persuade skeptical audiences? Should I brief this problem to my chain, IC peers, and key customers?

And Finally . . .

11 ☐ (b)(3) ***Strategic Focus.*** Do I have the proper focus on key strategic issues in my AOR to keep from being blind-sided? Is the urgent crowding out the important? Am I tackling the hard problems with sufficient focus and resources? Is the need for current intelligence driving my focus? Am I publishing the right mix of near-term and tactical assessments, on the one hand, and standback strategic estimates, on the other? Am I stuck in the weeds? Am I limiting my scrutiny only or primarily to those issues for which I have reporting? Am I effectively collaborating with others, even those outside my team or group, in ways that help me see the big picture?

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[redacted] Type I Surprise:

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SUDDEN HOSTILE ACTION

[redacted] *The US Navy's Battleship Row at Pearl Harbor minutes into the attack by Japan on 7 December 1941.*

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Type I Surprise: Sudden Hostile Action

(b)(3)

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Sudden hostile action involves abrupt, deliberate action by an actor aimed at disorienting, defeating, or destroying an unprepared opponent. The actor can be a state, an armed force, a terrorist cell, or a revolutionary party (see figure 2).

- The action in Type I surprise takes place by human design and agency, often in a concentrated geographic place (a capital city or a military base, for example) in a concentrated time span that can usually be measured in days, hours, or even minutes.

Subtypes and Examples of Sudden Hostile Action

Surprise Attack. Surprise attack includes any initiation or escalation of military violence using conventional or unconventional weapons against an unprepared target-adversary.[a] It includes surprise attacks by states and nonstate actors, such as terrorist organizations.

- Strategic surprise attacks may initiate war, as was the case in Japan's raid on Pearl Harbor and Nazi Germany's invasion of the Soviet Union in 1941.
- Alternatively, surprise attacks can also occur in ongoing wars in which the element of surprise involves the attack's location, timing, or novel methods and capabilities (see figure 3).

Examples of surprise attack include the following:

- The North Korean invasion of South Korea in 1950.
- The Soviet invasions of Hungary (1956), Czechoslovakia (1968), and Afghanistan (1979).
- Iraq's invasions of Iran (1980) and Kuwait (1990).
- The start of all the major conventional wars of the Middle East (1956, 1967, and 1973).
- Argentina's seizure of the British Falkland Islands in 1982. (b)(3)
- The al-Qa'ida attacks of 11 September 2001. (b)(3)

Military-Technological Surprise. This type of surprise involves the rapid development and deployment of new weapons systems or the novel adaption and employment of existing ones that an enemy or potential foe lacks the ability to counter. (b)(3) (b)(3)

Examples of military-technological surprise include the following: (b)(3)

- Nazi Germany's wartime development and use of early-generation cruise and ballistic missiles (the V-1 and V-2, respectively). (b)(3) (b)(3)
- The Soviet Union's development and test of an atomic bomb in 1949—at least five years earlier than US intelligence analysts had estimated. (b)(3)
- The Soviet launch of the Sputnik satellite in 1957, which stunned the US Congress and public. (b)(3)
- India's surprise nuclear tests in 1974 and, again, in 1998. (b)(3)

Abrupt Strategic Power Play. This subtype of sudden hostile action includes any move by an adversary to seize strategic advantages on the ground short of overt war. (b)(3) (b)(3)

Examples of strategic power plays include the following: (b)(3)

- Nazi Germany's remilitarization of the Rhineland in 1936 and its annexation of Austria in 1938. (b)(3) (b)(3)
- The Soviet blockade of Berlin from all land communications in 1948-49. (b)(3)
- East Germany's construction of the Berlin Wall in 1961. (b)(3)
- Soviet emplacement of strategic weapons in Cuba in 1962. (b)(3)

(b)(3)

(Continued on page 12)

[a] This training aid focuses mostly on strategic-level surprise attacks that initiate, escalate, or widen wars and conflicts. It does not focus on the use of surprise at the operational or tactical levels of conflict.

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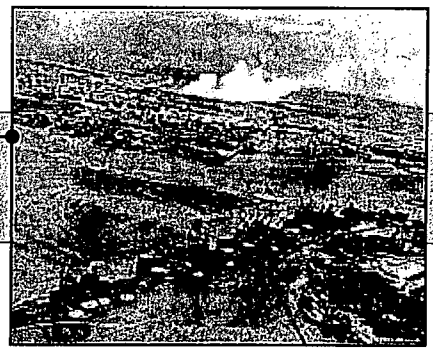
Figure 2
Anticipating Sudden Hostile Action

Abrupt, deliberate action by an adversary (such as a state, armed force, or terrorist cell) against an unprepared target



Archetypes	• Japan's attack on Pearl Harbor in 1941 • Egypt's attack on Israel in the 1973 Arab-Israeli war • The attacks of 11 September 2001
Essence	• Abrupt, deliberate, hostile deed by a unified actor (such as a state, armed force, terrorist cell, revolutionary vanguard party) aimed at disorienting, defeating, or destroying an unprepared opponent
Subtypes	• Surprise attack • Abrupt power play, such as the Soviet Union's blockade of Berlin from land communications in 1948 or its emplacement of offensive weapons in Cuba in 1962 • Coups • Diplomatic surprise, such as Egyptian President Anwar Sadat's ouster of Soviet military advisers in 1972 or his visit to Israel in 1977 • Political assassination • Initiation, escalation of mass human rights abuses
Barriers to Perception	• Effective use of denial (secrecy, security, stealth) and deception by an improvising, adaptive foe • Mirror-imaging; fallacious rational actor assumptions • Underestimation of actor's commitment, risk-tolerance, or bias toward action • Failure of imagination
Analytic Concepts/ Analogies	• Monitor and reassess warning indicators on regular basis • Conduct red team/forensic assessments of actor's means, motives, and opportunities to commit a sudden hostile act • Defensive casing and premortems of imaginable surprise: assess weaknesses, vulnerabilities in systems that may invite opportunistic attacks • Measure actor's level of political commitment, especially an all-out effort to bolster capabilities; assess strategic red lines • Do regular strategic stability audits

Source: Based on a review by a senior CIA analyst of more than two dozen cases of intelligence surprise experienced by US, British, French, Israeli, and Soviet services between 1939 and 2010.

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Varieties of Military-Technological Surprise

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Numerous situations can give rise to the kind of surprise involving an adversary's capacity to inflict military damage that the victim has failed to anticipate, including the following:

- **New weapons technologies,** such as US development and use of the atomic bomb and Germany's development of cruise and ballistic missiles in World War II, and Britain's introduction of tanks to the Western front in 1917 in World War I.
- **Significant improvements to or adaptations of existing technologies,** such as the Japanese development of shallow-running aerial torpedoes to attack Pearl Harbor in 1941; the USSR's mass production of the T-34 medium tank, with its sloped armor, reliable engine, and turreted gun early in World War II; and the Iraqi insurgents' effective use of and adaptations to improvised explosive devices.
- **The effective integration of two or more existing weapons or systems,** such as the Germany's use of radios, tanks, close air support aircraft, and airborne troops in the blitzkrieg invasions of the 1939-41 era or the rapid development by the US Navy and Marines of amphibious landing ships and craft, naval gunfire support, and close air support before and during World War II.
- **Tactical or doctrinal innovations that make one or more existing military systems more effective,** such as the US development of amphibious warfare doctrine in the 1930s or the use of B-29s—originally designed as a high-level daylight "precision" bomber—in low-level incendiary bombing missions against Japanese urban areas.

In most cases, military-technological surprise usually involves one or more new or adapted technologies coupled with tactical or doctrinal innovations and improved command and control to maximize their effectiveness.

A radar operator of the UK Women's Auxiliary Air Force watches her cathode ray tube monitor for signals of incoming enemy aircraft during World War II. The Royal Air Force's (RAF) development of an integrated air defense network, centered around early warning radar facilities, allowed the RAF to detect inbound German bomber formations early in their missions and to vector RAF Fighter Command planes to intercept them in a timely and efficient manner. Britain's superior early warning system and air battle management capability surprised German commanders and played vital roles in the United Kingdom's victory in the Battle of Britain in 1940-41.

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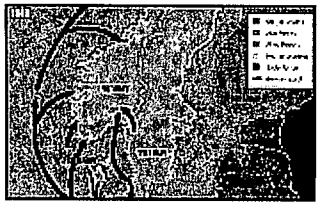
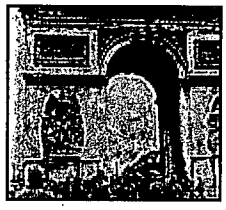
Figure 3 (b)(3)

The Dimensions of Strategic Military Surprise




(b)(3) Effective use of military surprise maximizes the likelihood of operational success and reduces the costs of an operation—in time, resources, and blood—to the attacker. Surprise attacks that succeed typically exploit multiple dimensions of surprise. To achieve surprise, would-be attackers often conduct extensive denial and deception operations to keep their intentions, plans, and capabilities secret from the target-actor and the international community.

Dimension (as seen from the perspective of a would-be defender)	Advantage (to the would-be attacker)	Examples
(b)(3) **Possibility:** Whether a potential adversary will attack	(b)(3) Strategic surprise attacks that initiate a war can be devastating because they can exploit all the other dimensions of military surprise.	(b)(3) Germany's attacks on Norway (1940) and USSR (1941); Japan's attack on Pearl Harbor (1941); North Korea's invasion of South Korea (1950); Arab-Israeli wars (1956, 1967, and 1973); Argentina's invasion of UK Falkland Islands (1982)
(b)(3) **Scale:** How widespread and intense the attack will be	(b)(3) The would-be attacker—particularly at the outset of a conflict—can try to calculate how much to risk and how many strategic resources to commit to an attack.	(b)(3) invasion of Japanese-occupied Manchuria (1945); China's intervention in the Korean war (1950); North Vietnam's Tet offensive (1968); the terrorist attacks of 11 September 2001 on US Homeland
(b)(3) **Timing:** When the attack will occur	(b)(3) An enemy can concentrate in time, picking a window most advantageous to the prospects of success, such as during a period of maximum mobilization and readiness or during a target-state's national holiday or a day of rest.	(b)(3) Germany's invasion of France, Low Countries (1940); Pearl Harbor; Western Allies' D-Day invasion at Normandy (1944); China's assault on Indian forces (1962)
(b)(3) **Location:** Where the attack will occur	(b)(3) An enemy can concentrate in space to achieve local superiority against the defending force; lack of intelligence on the location of the attacker's military forces obliges the defender to disperse its defensive systems.	(b)(3) German army attacks through the "impassable" Ardennes Forest (1940 and 1944); the D-Day invasion at Normandy (1944); the US invasion at Inchon, South Korea, (1950); Vietnamese communist assault on French base at Dien Bien Phu, Vietnam (1954)

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Figure 3

(b)(3)

The Dimensions of Strategic Military Surprise (Continued)

Dimension (as seen from the perspective of a would-be defender)	Advantage (to the would-be attacker)	Examples
Means: How the attack will be conducted	The attacker can employ new tactics, new doctrines, or new weapons to maximize the effectiveness of his forces and pit them against an enemy's weaknesses.	Germany's use of combined-arms forces and close-air support in the 1939-41 period; Japan's use of naval aviation—including shallow-running aerial torpedoes and armor-piercing shells as bombs—against US, UK, and Dutch naval forces (1941-42); Pakistan's infiltration of special forces, light infantry, and irregular forces disguised as civilians in the Kargil operation against India in 1999; the hijacking in 11 September 2001 by terrorists of multiple civilian passenger jets simultaneously and using them as weapons.
Novel Capabilities: Whether and how the enemy will employ new or untested military technologies[a]	A subset of novel means of attacking; use of new weapons can be devastating because the victim state's forces have no experience against them or training to counter or defeat them.	The UK Royal Air Force's use of radar against the German air force in the Battle of Britain (1940-1941); Germany's use of jets, V-1 and V-2 missiles (1944-1945); US use of the atomic bomb to end the war in the Pacific (1945); US use of reliable precision-guided munitions against Iraq (1991) and Serbian forces (1990s); use by al-Qa'ida and affiliates of well-trained, well-equipped suicide bombers in multiple simultaneous attacks (late 1990s to present); Iraqi insurgents' widespread use of reliable improvised-explosive devices, delivered and detonated by multiple means (2004-08)

(b)(3)

[a] Use of novel weapons and military technologies is a subset of the dimension of means—how an attack will transpire. It is listed here separately because the operational and strategic effects of new military technologies, effectively employed, can be devastating.

Source: Based on a review by a senior CIA analyst of unclassified accounts of more than two dozen cases of strategic military surprise experienced by the United States, Great Britain, France, Israel, the USSR, and other powers between 1939 and 2010.

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The Strategic Effects of a Successful Surprise Attack

Gen. Charles de Gaulle in his postwar memoirs described how French leaders crumbled under the weight of the German panzer thrust across France in the campaign from May to June 1940 that precipitated his country's surrender. His account stresses the role of shock—intellectual, psychological, emotional, and moral—in a successful surprise attack. The devastating shock that de Gaulle describes, which leads to the cascading failure of the target's entire defensive system, remains the holy grail of planners of surprise attacks.

"The crumbling of [France's] whole system of doctrines and organizations, to which our leaders had attached themselves, deprived them of their motive force. A sort of moral inhibition made them suddenly doubtful of everything, and especially of themselves. From then on, the forces of disintegration were to show themselves rapidly."

—Gen. Charles de Gaulle, in his postwar memoirs, *The Call to Honor*

Coup d'Etats. This subtype of surprise, sometimes referred to as a putsch, is the sudden, illegal ouster of an incumbent state leadership by elements of the armed forces or security services—often by force or the threat of force—in order to replace it with another group, either civil or military.[b] Coups were especially prevalent in Africa, Latin America, the Middle East, and Turkey during and after the Cold War era.

Examples of coups include the following:

- The overthrow of the Hashemite monarchy in Iraq by a nationalist army general and his followers in the "14 July Revolution" in 1958.
- The toppling of the Greek Government by a group of rightwing army colonels in 1967.

Massive Police Crackdown or Martial Law.[c] Authoritarian states pressed by demands for democracy or threatened by lawlessness or insurgencies will sometimes resort to a show of overwhelming force or to a massive crackdown on opposition to maintain their grip on power. Typically such events are preceded by secret planning for "emergency rule," the preparation of propaganda justifying the repression, and the quiet

US battleships at Pearl Harbor under attack by Japan on 7 December 1941. The telltale wakes of Japan's new shallow-running aerial torpedoes can be seen. US planes caught on the ground at Hickam air base burn in the distance.

dispersion of police and security forces to key sectors in the capital and other cities. Government security forces will then move rapidly to seal the borders, arrest dissidents and opposition journalists, and occupy opposition strongholds, such as universities or public squares. Coups are often followed quickly by crackdowns or the imposition of emergency rule or martial law.

Examples include the following:

- The bloody quashing of the Tiananmen Square prodemocracy movement by the Chinese army and police in 1989.
- The Polish army's imposition of martial law in December 1981 in response to the rise of the Solidarity labor opposition movement and to intense Soviet pressure to quell unrest.

Diplomatic Surprise. This includes any unexpected diplomatic move that has a major impact on the regional or global balance of power.

[b] Political scientist Samuel P. Huntington in his 1968 book, Political Order in Changing Societies, identified three classes of coup d'etat:

1. A breakthrough coup, in which revolutionary elements of the armed forces—often led by junior officers—overthrow the traditional government and creates a new ruling elite, such as occurred in Egypt in 1952.
2. A guardian coup, in which the avowed goal of the coup plotters—typically more senior army commanders—is to "save" the state from disorder, party strife, violent opposition, or foreign foes.
3. A veto coup, in which the army blocks democratic participation in the affairs of state. Usually led by senior commanders, this last type of coup often result in violent confrontations and suppression of civil opposition, such as occurred in Chile in 1973 and in Argentina multiple times during the 20th century.

[c] The temporary use of martial law can be a legitimate tool of civil government in bona fide cases of civil or natural disasters, when civil authorities alone are unable to maintain order or provide basic services.

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Examples of diplomatic surprise include the following:

- The Nazi-Soviet "nonaggression" pact in August 1939, which led to Germany's surprise attack on Poland one week later and the USSR's forcible annexation of eastern Poland by late September of that year and the Baltic states in 1940.
- The US rapprochement with Chairman Mao Zedong's China in the early 1970s after three years of secret diplomacy, which blindsided the Taiwan Government and rattled Soviet leaders.
- Egyptian President Anwar Sadat's "electric shock diplomacy," including his sudden expulsion of Soviet military advisers in 1972 and his peace offer to Israel in 1977.

Political Assassination. This type of sudden hostile action involves the premeditated killing of any influential political actor in or out of power by a person or group motivated by a political grievance. It excludes assassins motivated by psychotic impulses. Assassins can be "lone wolves" or members of a conspiracy.

Examples of political assassination include the slayings of the following:

- Egypt's President Sadat in 1981.
- Israeli Prime Minister Yitzhak Rabin in 1995.
- Pakistani presidential candidate Benazir Bhutto in 2007.

Violent Escalations by Revolutionary or Terrorist Movements. Such movements tend to start as small, cell-like clandestine organizations and gradually build their strength through clandestine measures. However, once they reach a critical mass of personnel, resources, weapons, and training, such groups will typically initiate political, guerilla, and/or terrorist campaigns to destabilize the state.

- Examples include the Bolshevik party in czarist Russia, the Viet Minh and Viet Cong in Vietnam, the FARC in Colombia, and al-Qa'ida in the Middle East and North Africa.
- Even after these groups launch their initial wave of attacks and declare war on the state, they will continue to exploit the tactical advantages of surprise in follow-on hostile actions, such as raids, robberies, kidnappings, assassinations, and bombings.

Initiation or Escalation of Major Human Rights Abuses. Extremist actors and governments tend to shroud the full scope of their plans to persecute and kill political foes and ethnic and religious minorities. They will often covertly distribute orders, weapons, and rewards to the militants carrying out the violence in order to minimize the ability of the victimized group to resist and of outside actors to intervene.

Examples include the following:

- Nazi Germany's escalations in its campaign to harass, persecute, and ultimately exterminate European Jews between 1933 and 1945.
- The Khmer Rouge's "autogenocide" during its rule from 1975 to 1979, carried out through mass executions and the starvation of more than 1 million Cambodians deemed corrupted by Buddhism, foreign influence, money, property, or education.
- Multiple rounds of "ethnic cleansing" in the Balkans during the 1990s, the worst of which occurred during the Bosnian war of 1992-95, when more than 2 million people were displaced and tens of thousands killed.
- The Rwandan genocide, in which the Rwandan military and Hutu militia groups killed more than 500,000 Tutsis in 1994.

The Fait Accompli: Tool for Radical Leaders

Decisive unilateral acts that create new facts on the ground and catch foreign actors—including intelligence services—unprepared are a favorite tool of action-oriented actors seeking to upend the status quo. Intelligence scholar Michael Handel notes, for example, that Adolf Hitler made repeated use of faits accomplis to catch opponents off guard and hinder opposition actors from mobilizing against him. Handel notes that Hitler established early on the pattern behind his frequent use of surprise.

> "The preparatory stage of deception was intended to divert attention from his actual goal and reassure potential opponents that he did not intend to do what they feared he might. The fait accompli was then followed by a flood of new assurances that since Germany desired peace, this was the last such act of its kind; in this manner, he allayed fears and set the stage for his next move."
>
> —Intelligence scholar Michael Handel, in *The Diplomacy of Surprise*, 1981

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Barriers to Early Perception of Type I Surprise

(U//FOUO) There are several barriers to early perception and timely warning of Type I surprise. Secrecy on the part of the aggressor-actor planning to surprise an unprepared foe is foremost.

Denial and Deception by Smart, Adaptive Actors. The goal of would-be attackers is to conceal hostile plans and preparations from onlookers and prevent the intended victim or the third parties from taking effective counteraction. The ability of US enemies—from Imperial Japan and Mao's China to North Korea and al-Qa'ida—to conceal preattack plans and preparations has been amply demonstrated.

Scholars of surprise observe that even rudimentary denial and deception efforts often work in thwarting timely warning and response by the target actor. These efforts can include the following:

- Publicly denying aggressive intent.
- Lying about the purpose of prestrike activities.
- Announcing "routine" military training maneuvers to mask preattack staging.
- Publicly demobilizing token numbers of reservists.
- Feinting in another direction.
- Intimating that the prestrike activities are merely a bluff.
- Heralding bogus eleventh-hour peace initiatives or offering to enter into negotiations.

Sound operational security and standard military cover, camouflage, and concealment of hostile forces can go a long way to countering even the most sophisticated intelligence collection systems, judging from unclassified assessments of surprise and intelligence failure.

Bold, Resourceful Enemies. The sheer audacity of a surprise attack can catch an adversary unprepared. Roberta Wohlstetter—the doyenne of intelligence surprise studies—discussed in her 1962 book, *Pearl Harbor: Warning and Decision*, the inability of US officials to conceive of a radical Japanese response to its military quagmire in China and escalating tensions with the United States. Wohlstetter identified the US officials' "poverty of imagination" as the root cause of US vulnerability to a surprise attack at Pearl Harbor. Racist stereotypes also played a part: many US Navy commanders could not believe that the Imperial Japanese Navy could pull off such an ambitious and complex strike operation so far from Japan.

Paranoid Actors' Penchant for Sudden Hostile Action

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"The essential cognitive feature of the paranoid is a rigid, intentional search for external danger. . . . Because of the paranoid's image of the world as very conflictual [sic] and because of the image of the adversary as incorrigibly aggressive and politically devious, the paranoid leader has a strong preference for the use of force over persuasion. . . . the leader would prefer a fait accompli that directly affects the capabilities of the adversary to a coercive threat that tries to affect the willingness of the adversary to threaten. . . . In a crisis, there is a strong preference for what may be seen as preemptive action. The paranoid may initiate a crisis or war out of the belief that preventive action against an adversary is necessary . . . since the adversary is [presumed to be] preparing to act . . . [and] since it is preferable to act first while the military balance is more in one's favor."

(b)(3)

—Former CIA leadership analyst in an essay on profiling political leaders at a distance

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- This pattern—disbelief that an actor would embark on a course of action that was potentially catastrophic—was repeated before the Cuban Missile Crisis in 1962: US officials knew that the Kremlin was increasingly anxious about the strategic balance and about US pressure on Cuba, but few in the IC[d] believed that Soviet Premier Nikita Khrushchev would risk a nuclear war by secretly emplacing nuclear weapons 90 miles off Florida.

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- The 9/11 Commission Report makes clear that the key organizations involved in US air safety—the Federal Aviation Administration, the North American Aerospace Defense Command, and the airlines—were utterly unprepared for foreign terrorists to take over US civilian passenger jets and use them as weapons.

(b)(3)

[d] Then Director of CIA John McCone was an exception. He reasoned that the Soviets were building surface-to-air missile sites in western Cuba—which US intelligence had confirmed—in order to protect covertly deployed Soviet nuclear forces rather than to defend Cuba from US invasion, an assessment that turned out to be accurate. Proceeding from rational unitary actor assumptions, Sherman Kent—then the head of the CIA's Office of National Estimates—and much of the rest of the IC judged such a course of action too risky and out of character for the Soviet leadership.

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[redacted] Denial And Deception In Cases Of Mass Atrocities

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[redacted] Anticipating the initiation of mass human rights abuses and comprehending their scale and intensity as they occur are difficult analytic challenges. Past cases of mass atrocities demonstrate the ability of hostile actors to conceal their intentions and plans and deceive outside observers until it is too late to thwart or mitigate their violence against the victims. A policy planning handbook on responding to the dangers of mass atrocities recently published by the US Army notes, for example, that:

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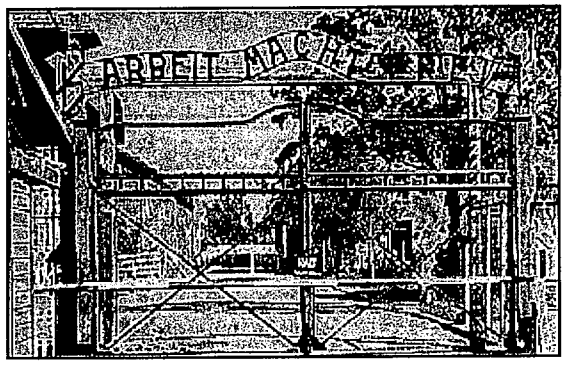
[redacted] "Perpetrators decide to conduct mass atrocities, mobilize their resources, draw up "death lists" or otherwise identify intended targets, and possibly segregate victims into ghettos or camps. A pretext for such actions may be arranged, or an unforeseen event may spark these measures. Additional preparations may include transportation of victims, identifying locations for mass killing, and determining means of disposing of bodies. Perpetrators will also take measures to disguise their actions or deceive both victims and outsiders as to what will occur (e.g., victims may be relocated and collected together in order to "protect" them). The many individuals involved in the actual conduct of the mass atrocities may need to be convinced of the legitimacy of the actions as well as the need for secrecy . . . Perpetrators will attempt to obfuscate mass atrocity situations, blame the incidents on the victims or deny their occurrence. They will impede external efforts to determine the truth of events. Strong denial may presage future waves of mass atrocities . . ."

[redacted] —From *Mass Atrocities Prevention and Response Options: A Policy Planning Handbook*, published by the US Army Peacekeeping and Stability Operations Institute in 2012



[redacted] *The infamous Arbeit Macht Frei—work makes you free—gate to Auschwitz concentration camp.*

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"He Had a Gambler's Heart": Adm. Yamamoto's Bias for Action

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Analysts can evaluate the risk tolerance and bias for action of key actors. A leading US scholar of the attack on Pearl Harbor in 1941 provides a glimpse into the mentality of one particularly bold actor. Gordon W. Prang—author of the 1991 book, *At Dawn We Slept: The Untold Story of Pearl Harbor*—wrote of Adm. Yamamoto Isoroku, Commander in Chief of the Imperial Japanese Navy's Combined Fleet at the time of the attack:

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"Yamamoto's temperament also had much to do with the strategy he eventually conceived [for attacking Pearl Harbor]. Some of his maxims . . . reveal his turn of mind: 'An efficient hawk hides its claws'; 'A cornered rat will bite'; 'If you want the tiger's cubs, you must go into the tiger's lair' . . . An inveterate gambler, he enjoyed nothing more than a competitive round of chess, poker, or bridge . . . 'In all games Yamamoto loved to take chances just as he did in naval strategy,' explained [one of his favorite staff officers] Capt. Yasuji Watanabe. 'He had a gambler's heart.'"

Adm. Yamamoto Isoroku.

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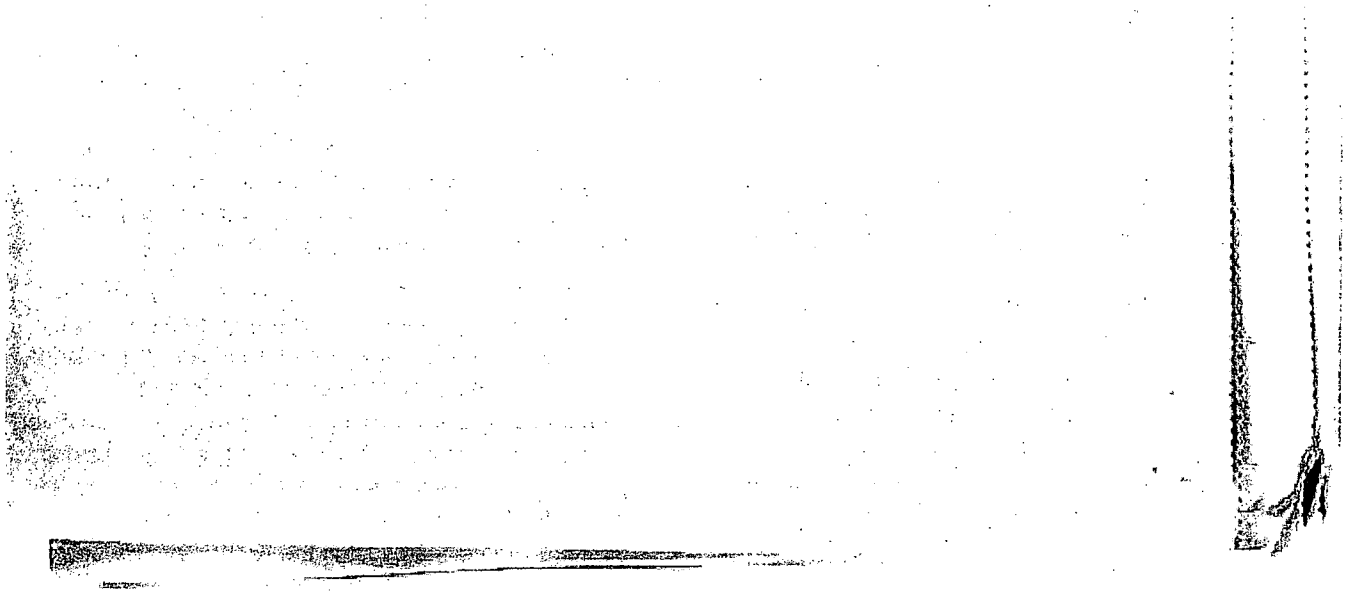

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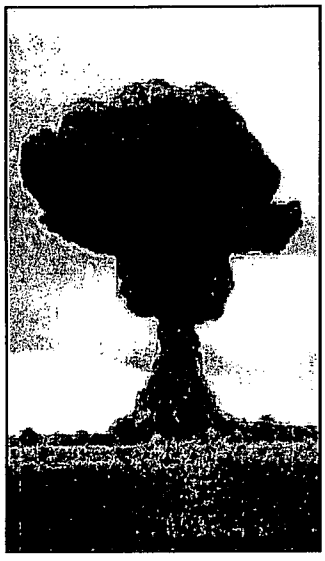

The Soviet Union successfully tested an atomic bomb in August 1949—five years before the IC judged it to be likely. Soviet leader Josef Stalin's implacable determination to acquire the bomb and the resourcefulness of Soviet research and development efforts—abetted by Soviet espionage penetration of the Manhattan Project during World War II—enabled the USSR to greatly accelerate its program to build, test, and deploy atomic weapons.

Mirror-Imaging a "Rational" Actor. In the history of surprise, zealous alpha actors with outsized appetites for power, tolerance for risk, and biases for action—Adolf Hitler, Gamal Nasser, Khrushchev, Sadat, Saddam Husayn, Kim Il-Sung, and Kim Jong-Il—have sought to seize the initiative against their presumed foes. Often, such actors tend to pit their own audacity against the normal human tendency to assume that "tomorrow will look like today," that "the other guy" thinks the way "we" do, and that dramatic departures from the status quo are impossible. Assumptions about the permanence of the status quo and the presumed "rationality"—often narrowly defined or confused with reasonableness—of hostile actors increase the victim's vulnerability to denial and deception efforts by crafty, adaptive enemies. The difficulty of comprehending the full psychological, cultural, political, and organizational context in which would-be hostile actors operate compounds the problem.

- The head of Israeli military intelligence in 1973 could not conceive that Sadat would initiate a war that Egypt could not win militarily. The intelligence chief assumed that the Egyptian armed forces would wage war the way that Israel would—by first seizing air superiority over the region—which the Egyptian air force clearly lacked the capability to achieve.
- As then chief of the CIA's Office of National Estimates, Sherman Kent wrote after the Cuban Missile Crisis to explain the IC's failure to anticipate Soviet deployment of nuclear weapons to Cuba, "no estimating process can be expected to divine when exactly the enemy is about to make a dramatically wrong decision. We [in the IC] were not brought up to underestimate our adversary [in this case, Soviet leader Khrushchev]."

Aids To Anticipating Type I Surprise

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Timely, accurate intelligence reporting on the hostile intentions, strike capabilities, and secret plans of would-be hostile actors remains the surest aid to analysts trying to avert Type I surprises. However, if the history of intelligence failures experienced by all major powers since the onset of World War II is any guide, conclusive intelligence reporting on an adversary's plans and decision to attack will remain the exception, rather than the rule. Therefore, while developing and maintaining close ties to intelligence collectors remain essential, analysts should assume that critical intelligence collection gaps will persist and that analysts will need other means to bolster their ability to anticipate possible hostile action.

(b)(3) These supplemental approaches and tools attempt to:

- (b)(3) Identify patterns of sudden hostile action based on historical case studies and help analysts to determine how similar current situations may be to historical analogues.
- (b)(3) Get into the heads of would-be hostile actors in realistic, sophisticated ways and anticipate their possible moves using methods that reduce the dangers of mirror-imaging.
- (b)(3) Assess the vulnerabilities of would-be victims of sudden hostile action in analysts' areas of responsibility.

(b)(3) ***Assess an Actor's Commitment and Hostility, Not Just "Rationality."*** This approach requires a deeper focus on actors' motives and intentions in analytically sophisticated ways. It seeks to fix analysts' attention on would-be hostile actors who may be motivated by pride, fury, revenge, aggrandizement, and ideology. Such actors are subject to opaque psychological, political, and organizational pressures to act. They often receive flawed, politicized intelligence. These actors will often seek to change the rules of the game or to destroy the old game completely and replace it with one of their making via sudden hostile action (see figure 4).

- (b)(3) For examples, Adolf Hitler sought to overturn the post–World War I Versailles Treaty order in Europe as a prelude to his campaign of genocidal expansion; Josef Stalin to project Soviet power into and communize the states of Central Europe and to subvert liberal democracies in Western Europe; Fidel Castro to check US "neocolonialism" and promote radicalism in the Western Hemisphere; and Usama Bin Ladin to oust the United States from the Arab-Islamic world and depose "apostate" regimes in the region.

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A US expert on strategic warning during the Cold War era, Cynthia Grabo, noted that would-be hostile actors miscalculate for various reasons: misjudgments of an adversary's strength, ideological fixation, hubris, domestic pressures, nationalist hysteria, pique, or just plain desperation. Under the spell of such pressures, an actor may embark on an imprudent or even disastrous course of action.

- Scrutinizing assumptions[e] about the full range of factors that can influence an actor's behavior—including personal, professional, organizational, and social pressures—and tracking them over time can help analysts account for zeal, folly, honor, revenge, and malice in forecasting leaders' actions and determine the trend in an actor's extremist rhetoric and actions.
- Using well-crafted red teams to consider alterative explanations for adversaries' behavior and to simulate would-be hostile actors' calculus for employing surprise can help analysts draw on deep expert insights in ways that avoid mirror-imaging, rational actor assumptions, or caricatures.

APPLICATION

Analysts—working individually or in analytic teams—can identify who the possible alpha actors are in their areas of responsibility, study the political pressures acting on them, assess their timeline for action, track their rhetoric and behavior over time, and anticipate their possible recourse to various options for sudden hostile action.

Recognize Historic Patterns of Surprise. Sudden hostile actions sometimes resemble historical precedents for surprise action or follow discernible patterns. Such actions are rarely what leading intelligence scholar Richard K. Betts in his 1982 book, *Surprise Attack,* calls "bolts from the blue."

- The author noted that ". . . there are no significant cases of bolts from the blue [that is, a major surprise attack not preceded by an earlier political crisis] in the 20 century. All major sudden attacks occurred in situations of prolonged tension, during which the victim state's leaders recognized that war might be on the horizon."
- Instead, sudden attacks tend to occur during or after an escalation in tensions that is often observable to intelligence organizations.

Analysts should be aware of the relevant historical precedents for surprise action under various circumstances in their areas of responsibility. Studying such precedents can help analysts expand their intellectual inventory of relevant historical analogies and aid in early pattern detection and recognition.

- A senior Japanese naval aviator who helped plan the attack on Pearl Harbor told US interrogators after the war that he was dumbfounded that the United States had not studied Japan's use of strategic surprise to initiate its 1904-05 war against Russia.

Political and military analysts would benefit from being proactive in assessing the risks of surprise attacks as tensions escalate, even if reporting on force postures and deployments is scarce or recourse to a military "solution" seems unfeasible or reckless.

Another critical development for analysts to watch for is mobilization in all its forms. Large-scale national mobilization of military power that imposes a high opportunity cost on the civilian economy remains the best predictor that a state is preparing to undertake major military operations, according to a leading scholar of surprise.

- Political analysts will usually have the lead responsibility for recognizing the rise of radical factions and leaders, analyzing escalating tensions, identifying the breaching of possible strategic "red lines," and warning of the rising urgency and extremism of the political or diplomatic dialogue.
- Military analysts, by contrast, will have the lead in closely monitoring shifts—real or perceived—in the interstate balance of power and balance of threats as well as indicators of preparations for sudden action by the military and/or security forces.

In similar fashion, terrorism analysts can gain insight by closely tracking the substance and tone of extremist groups' public communications. Increasingly aggressive rhetoric that employs violent imagery, blunt threats, and apocalyptic visions to spur psychological mobilization, demonize enemies, and legitimize mass killings are often indicators of a looming escalation of violence.

APPLICATION

Analytic teams can study the academic and intelligence literature on a potential adversary's past uses of strategic surprise and assess its current doctrine

[e] Various models and premises have been used to describe and justify models that attribute rationality to actors. The basic idea is that actors try to maximize benefits, minimize costs and risks, and weigh options for action via some form of cost-benefit-risk analysis—however crude, intuitive, or informal. In shorthand usage, rationality has often been confused with "common sense" or reasonableness.

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Figure 4

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A Spectrum For Measuring an Actor's Extremism

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Dimension	"Rational" Status Quo Actor	Committed Hostile Actor
Strategic Goal Content	**Feasible.** Attainable within existing system, such as maintaining status quo or achieving moderate or incremental goals.	**Radical.** Goals are incompatible within prevailing strategic landscape. Examples include total conquest of another state, genocide of minority group, totalitarian rule over a country.
Strategic Goal Commitment	**Measured.** Actor willing to settle for less than maximal goals.	**Intense.** Actor is "fanatical"; adheres stubbornly to maximal goals.
Tolerance of Risk in Pursuing Goals	**Low.** Actor is prudent, focused on risk avoidance or minimization.	**High.** Actor prone to adventurism, high-risk options acceptable.
Means-Goal Relationship	**Instrumental.** Actor desires to be rational, minimizes costs, links means to goals, adheres to at least some norms.	**Delinked.** There is a disconnect between goals and means. Actor fixates on goals, ignores costs, exalts "sacrifice," distrusts calculus that subverts ideology.
Degree of Self-Control, Emotional Stability	**Relatively high.** Personal grievances, vendettas do not drive strategic behavior.	**Low.** Pride, fury, resentment, revenge exert sizable influence on judgment, actions.

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"Rational" Status Quo Actor — Committed Hostile Actor

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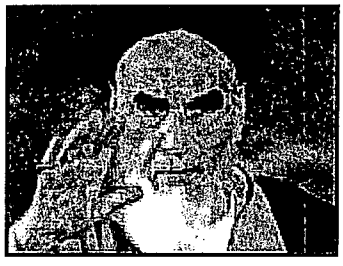
[a] This matrix is derived from the model of "crazy actors" developed by Professor Yehezkel Dror, an Israeli scholar of political science at the Hebrew University of Jerusalem in the 1970s. It modifies some of Dror's definitions and nomenclature.



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on surprise. Teams can also monitor, evaluate, and track over time a would-be hostile actor's strategic "red lines"—actions by rival players that an adversary would deem hostile to vital interests and, therefore, as a cause for war. Similarly, "tacit understandings" between the opposing parties in enduring strategic rivalries—for example, China and Taiwan, India and Pakistan, Georgia and Russia, Armenia and Azerbaijan—should be examined and evaluated over time because breaches of them can lead to crises that typically increase the risk of war and surprise.

Apply Theories of Surprise Action. Awareness of the academic theories of surprise, which are principally based on historical case studies, can also help IC analysts assess increasing risks of Type I surprise. These theories tend to focus on two key conditions as particularly salient risk factors for surprise attack.[f]

- The first is **an actor's acute sense of strategic vulnerability,** particularly if communicated by warnings of encirclement or fears of extinction.
- The second condition is **an actor's heightened sense of its own offensive capacities via the possession of elite strike arm**—such as Imperial Japan's carrier battle group, Nazi Germany's armored forces, Israel's air force, or al-Qa'ida's suicide bombers.

APPLICATION

Analysts can assess whether these preconditions for sudden hostile action—the presumed advantages of near-term offensive action or the perception of adverse long-term strategic trends—apply, as seen from the optic of an increasingly desperate or zealous actor or actors. If so, these conditions would suggest higher risks of sudden hostile action than would otherwise be the case. Military journals and doctrine, formal strategy pronouncements, warnings via diplomatic channels, and political rhetoric can all shed light on aspects of foreign thinking on these strategic matters.

Conduct "Forensic" Analysis of Possible Hostile Actors. Analysts can examine which actors possess the motives, means, constraints, and opportunities to engage in various options for hostile action against foreign or domestic actors.

Motive refers to the intentions, ideology, and animating beliefs of a potentially hostile actor, particularly as they define his threat perceptions and enemy images. It also covers incentives to act suddenly, such as the desire to seize a neighbor's resource-rich territory or "redress" specific grievances, such as the loss of territory to a neighboring state in a previous war or concern about a rival's threats or military capabilities, as he perceives them.

Means refers to the totality of capabilities for a major hostile action, including preventive war, surprise attack, a coup, or genocide. These means can be at hand or in development. Development of costly means of attack remains a key guide to an actor's possibly hostile intentions. The trend line—whether these capabilities for surprise action are increasing or decreasing—are as important as their level at any given point in time.

Opportunity refers to the feasibility and practicality of sudden hostile action in obtaining the goals sought by the actor, such as the ouster of a hated or inept leader, the elimination of a despised minority group, or the neutralization of a rival state's deterrent forces. The focus is on the opportunities that the would-be actor perceives as he surveys the relevant operating environment. Opportunities cover environmental factors that may create a more permissive environment for sudden hostile action. Factors leading to a more permissive environment might include the following:

- A rival actor's focus on domestic upheavals, events in another theater of war, or an ongoing military campaign. For example, Fascist dictator Benito Mussolini of Italy and Imperial Japan both took advantage of Germany's crushing defeat of France in 1940 to seize French territories; Husayn's Iraq sought to exploit Iran's postrevolution instability to seize contested territory in 1980.
- The international community's preoccupation with grave economic conditions or with another crisis. Examples include the Suez Crisis in 1956, which distracted Western powers from the Soviet Union's preparations to suppress the Hungarian uprising against communist rule; and Iraq's seizure of Kuwait in August 1990, when Western states were trying

[f] Offense-defense theory and offensive realism are hypotheses from international relations and strategic theory that seek to explain the outbreaks of war. Offense-defense theory posits that war becomes more likely when great powers judge that:

1. Conquest is relatively more feasible than in other periods.
2. Their own strategic offensive capacities are greater—or are deemed greater—than those of a rival power or powers.
3. They are vulnerable—or fear that they are—to strategic attack from one or more foreign powers. It also holds that false evaluations of points 1, 2, and 3 are relatively common on the part of great powers because of ideological distortions, poor intelligence, faulty net assessments, and the influence of expansionist interest groups.

Offensive realism posits that great powers will seek to maximize their absolute and relative power vis-a-vis other states and will seek to do so by expanding their military capacities and by seeking to expand and achieve dominance when the opportunity avails itself.

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Academic Theories of Surprise Attack (b)(3)

One scholar of intelligence affairs, Professor James J. Wirtz, summarizes the theory of surprise in three propositions. (b)(3)

- Surprise temporarily suspends the reciprocally antagonistic nature of the battlefield by catching the enemy when he is unprepared to resist effectively. A military organization in a state of unreadiness is more akin to a large peacetime bureaucracy in custody of scarce commodities (weapons and ammunition) than it is to a combat force that is ready to fight. (b)(3)
- Strategic surprise will be an especially enticing option to the militarily or economically weaker party in a strategic rivalry. The advantages of surprise offer the weaker side the prospect of achieving decisive results against a stronger opponent that would probably be unobtainable in a war of attrition. The party that is clearly stronger, by contrast, often hopes displays of might can deter a foe or intimidate him into making concessions without having to resort to war. (b)(3)
- Strategies based on strategic surprise appear to all concerned parties as extremely risky before the attack and often turn out to be reckless and ill advised. The very "unthinkable" nature of an audacious plan of attack makes it more likely both to achieve success—surprise—in the short run and to infuriate and unify the victim of surprise in the long run, if he can absorb the initial blow. (b)(3)

Other scholars note that the risks of surprise attack are particularly high in two cases. (b)(3)

- When one side judges that long-term trends in the strategic balance are unfavorable because of inferior geographic position (often perceived as "enemy encirclement"), economic decline, or slower population growth; in such cases, an actor—such as a Adolf Hitler or the leadership of prewar Japan—is strongly tempted to seize the initiative via decisive action to head off what he fears will otherwise be a protracted deterioration in his strategic position. (b)(3)
- When military planners judge that the attacking side holds a decisive advantage because offensive action would allow the attacker to seize the initiative, maximize the presumed superior elan on the part of the attacking force, and exploit the advantages that current weapons, doctrine, and tactics may hold for the attacker. (b)(3)

The charred west facade of the Pentagon, days after the terrorist strike on 11 September 2001. The attack killed all 64 people on board American Airlines Flight 77—including the five al-Qa'ida hijackers—as well as 125 people who were at work in that portion of the building.

The remnants of two Egyptian jets destroyed on the ground during the Israeli Air Force's surprise attack at the outset of the Six-Day War. The Israeli air attack, Operation Focus, achieved total surprise, eliminated Egypt's air force from the war, and assured Israel of air supremacy for the duration of the 1967 conflict.

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to manage German unification and the collapse of communism in the Soviet Union and Eastern Europe.

- In the case of a potential coup, a leader already weakened by ill health or declining popularity.

APPLICATION

Examining these forensic factors enables analysts to do a quality of information check regarding the reporting available on each of these criteria (motives, means, and opportunities) and to develop signposts to help warn of new developments—such as a hostile actor's decision to heavily invest in strike weapons, evidence of a more permissive strategic environment, or increased incentives to act against a historical foe.

To conduct this type of forensic analysis, terrorism analysts should stay particularly close to collectors—including domestic law enforcement—and do various types of link and network analysis to gain a fuller appreciation of the structures, plans, and operations of extremist organizations.

Vulnerability Assessments. Vulnerability assessments, sometimes called defensive casing, can improve analysts' understanding of hostile actors' priorities among various potential targets for surprise attack.

- This technique focuses on the would-be target's vulnerabilities. It involves a structured effort by a diverse team of experts to brainstorm various categories of potential targets—a state, military force, security force, specific leader, or critical infrastructure—and assessing the relative merits, drawbacks, and risks of each potential target from the perspective of a would-be attacker.

APPLICATION

Prospective targets of possible hostile action—particularly in cases of strategic military surprise and terrorism—can be assessed, categorized, and ranked from multiple perspectives. One perspective is that of the potential victim: how might he "objectively" rank his own strategic centers of gravity, essential infrastructure, economic core, and renowned religious or historic sites in terms of importance, vulnerability, and symbolic value. This exercise could be repeated from the perspective of prospective attackers: how might they assess a would-be victim's possible targets in accord with these criteria. How might they rate a would-be victim's readiness and resilience in the event that surprise action is successful?

Forensic Assessment of Mass Atrocities

"Perpetrators require the motivation, means, and opportunity to conduct mass atrocities. Motivations may include identity issues, the desire to acquire (or retain) political and economic power, territory, or revenge. Means include the political latitude, plans, and the supporters required to commit mass atrocities. The opportunity to commit mass atrocities generally occurs during three stages: a crisis that triggers the events; perpetrator mobilization to conduct mass atrocities; and violence which may begin at a low level before escalating to mass atrocities."

—From *Mass Atrocities Prevention and Response Options: A Policy Planning Handbook*, published by the US Army Peacekeeping and Stability Operations Institute in 2012.

Red Teaming. This technique relies on a rigorous, systematic effort to zero in on the strategic and tactical calculus of would-be hostile actors. Ideally, red teams include participants who can accurately represent the ethos, intentions, structures, and capabilities of a hostile actor or organization.

- For example, red teams could help estimate terrorist group's relative priorities for target selection. Red teams cannot be expected to divine plans for a specific attack, which still requires timely and accurate intelligence.

Empathy as an Analytic Tool. One intelligence commentator, psychology professor Ralph White, recommends that analysts cultivate empathy to hone their understanding of foreign actors "from the inside looking out, not merely from the outside looking in." To foster empathy, White advises analysts to continually pose such questions as the following:[9]

- How would I feel if I were facing the situation they are facing now?
- How would I feel if I had been through the experience I know they have been through?
- How should I correct my first answers to those questions on the basis of what I know about the differences between their political culture and mine?

[9] Psychology professor Ralph White draws a sharp contrast between empathy as a tool for understanding an opponent and sympathy, which he characterizes as "sharing (or agreeing with) the thoughts and feelings of others."

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Analysts can hone White's technique to counter biases and stereotypes and to zero in on how foreign actors might rate the attractiveness of various options for sudden hostile action.

APPLICATION

Well-composed red teams could also assist in generating, expanding, updating, and monitoring the list of specific, observable indicators—signposts—for prestrike activities by insurgent or terrorist groups, including in such areas as target casing, bombmaking, personnel deployment, and movement to the target.

An unclassified JASON report for The MITRE Corporation that discusses the use of red teaming to anticipate catastrophic terrorist attacks notes the importance of recruiting team members immersed in both the foreign culture and the "professional culture" of the terrorist group—its mission, history, beliefs, and tactics—that the red team wants to mirror.

This immersion into the terrorist group that is being assessed should include deep insight into the group's experiences, education, skills, training, contacts, and past targets.

Exercises, War Games, and Simulations. These tools are intended to simulate the dynamics of actual strategic interactions, including combat operations. Such efforts to game out the possible outcomes of force-on-force encounters often come with high startup costs in resources, planning hours, and personnel—but they can also help simulate the conditions and pressures conducive to sudden hostile action. Military exercises have multiple purposes, including measuring the temptation for the "red" team—the postulated hostile actor—to undertake a surprise attack and revealing weaknesses in the "blue" team's defenses and force posture.

- In 1932, nearly 10 years before the Japanese strike on Pearl Harbor, for example, approximately 150 US Navy carrier-launched planes successfully "attacked" the Pacific Fleet at anchor in Pearl Harbor on a Sunday shortly before dawn in a war game exercise.
- Navy umpires initially declared the attack a total success, news of which was reported in *The New York Times* days later. However, according to one academic assessment, Navy commanders failed to absorb and disseminate the lessons of the widely publicized 1932 exercise, whereas Japanese intelligence personnel and military planners appear to have closely studied the exercise. (b)(3)

(b)(3)

APPLICATION (b)(3)

Military Indications and Warning. The collection and assessment of data about the intentions and capabilities of foreign military forces has been the basis for warning of war in the modern era and can also enhance the effectiveness of war games. Since World War II, the major powers have spent enormous sums—the majority of their intelligence budgets—to augment their ability to collect data on the military strength, weaknesses, operations, training, and weapons of hostile and potentially hostile states. The collection of military indicators will remain one of the linchpins of strategic warning for three reasons: (b)(3) (b)(3) (b)(3)

- Military preparations are a necessity for war. (b)(3)
- Many of these military preparations are discernable or at least potentially discernable to outside states seeking the information. (b)(3) (b)(3)
- Many of these preparations are costly and disruptive to the civilian economy, so states do not undertake them lightly, purely for purposes of political theater, or bluff. For that reason, they tend to be reliable indicators of seriousness of intent and readiness to act. (b)(3) (b)(3)

Checking for Vulnerability to Coups. Anticipating military coups based on intelligence reporting alone is rare because the coup plotters—unless they are seeking the approval of outside powers—have a powerful incentive to maintain secrecy to achieve their aims. However, examining five preconditions that correlate closely with increased odds of military coups may help analysts to anticipate their risks, if not their actual timing. (b)(3)

- *Class privilege.* To what degree does the military—particularly its officer corps—draw from a privileged element of society? Is the officer corps perceived as a societal elite—such as the Prussian Junkers, who controlled the German army before World War I—at odds with other elements of society, such as the middle class or workers? (b)(3) (b)(3)
- *Historical role.* Does the military have a special or historical role in upholding the constitution or preserving the domestic order, such as the Turkish army has had since at least 1960? Does it view itself as the custodian of the state or as a state within a state, as the Japanese army did in pre–World War II Japan? (b)(3) (b)(3)

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- *Security crisis.* Does the country face a difficult national security challenge, such as a serious domestic insurgency, revolutionary activism, or a menacing strategic rival? Are the commanders of armed forces preoccupied with domestic "enemies," such as Chile's were before the 1973 coup led by General Augusto Pinochet against President Salvador Allende?
- *Civil-military strife.* Is the military at odds with the civilian leadership, such as the Chilean army was during Allende's presidency in the early 1970s? Does the military tend to distrust democratic or civilian elements of the government? Is there a sizable civilian element—landowners or privileged classes—that support the military's vision against that of the government?
- *Politically ambitious officers.* Is the military led by "alpha actors" contemptuous of civil authority or threatened by militant junior officers who are antagonistic to existing political conditions, such as those in Japan in the mid-1930s? Is there a cohort of junior officers who equally disdain their senior commanders or political leaders?

APPLICATION

Evaluating civil-military relations by these criteria—and comparing them with the available reporting—can help analysts identify situations that are relatively more likely to lead to ruptures in civil-military relations, including coups. Such evaluations should also cover the national police and domestic security and intelligence forces—particularly if they are uniformed or politically influential. Assessments should be tracked over time to monitor the trends in civil-military ties and determine if the factors conducive to coups are worsening or abating.

On the Value of War Games: A US Admiral's View

"(U) The war with Japan had been reenacted in the game rooms [of the US Naval War College before World War II] by so many people and in so many different ways that nothing happened during the war that was a surprise—absolutely nothing except the kamikazes toward the end of the war."

US Navy Flt. Adm. Chester W. Nimitz

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Stealthy Surprise? Sudden Hostile Actions Using Novel Methods

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(U//FOUO) Surprise attacks have traditionally had one positive consequence for the decisionmakers of the targeted actor: they afford the benefit of strategic clarity. Once the attack occurs, the victim state in most cases has a general idea of what has happened, who the enemy is, what his intentions are, and how the enemy is going to pursue them. Future cyber and biological attacks might not afford such clarity.

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- The vast majority of such attacks will almost certainly employ surprise to maximize effectiveness. However their nature and goals will probably not be immediately obvious, even after the attack has been launched and it is harming the victim state's population, economy, or IT infrastructure.
-) Biological warfare attacks, for example, may be masked, at least initially, as the onset of natural epidemics. Targeted cyber attacks may be impossible to distinguish from the work of hackers or of individual lone wolves or spontaneous networks.

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Cyber Weapons and the Risks of Preemptive Attack: One Scholar's View (b)(3)

"[redacted] One of the frightening dangers of an uncontrolled arms race in cyberspace [is that] once released, virus developers generally lose control of their inventions, which will inevitably seek out and attack the networks of innocent parties. Moreover, all the countries that possess an offensive cyber capability will be tempted to use it now that the first shot has been fired. (b)(3)

[redacted] During the Cold War, countries' chief [strategic] assets were missiles with nuclear warheads. Generally, their number and location was common knowledge, as was the damage they could inflict and how long it would take them to inflict it. (b)(3)

[redacted] Advanced cyberwar is different. A country's assets lie as much in the weaknesses of enemy computer defenses as in the power of the weapons it possesses. So in order to assess one's own capability, there is a strong temptation to penetrate the enemy's systems before a conflict erupts. It is no good trying to hit them once hostilities have broken out; they will be prepared, and there's a risk that they already will have infected your system. Once the logic of cyberwarfare takes hold, it is worryingly preemptive and can lead to the uncontrolled spread of malware." (b)(3)

[redacted]—Scholar and author Misha Glenny in a commentary from June 2012 in *The New York Times*

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"A Fatal Lethargy of Mind": A Wartime Commander's Take on Preparedness and Surprise

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In the first major naval engagement of the Guadalcanal campaign—just eight months after the Pearl Harbor attack—the Imperial Japanese Navy surprised and routed US and Allied surface combatants guarding the Marine beachhead on Guadalcanal. The Battle of Savo Island, which took place on 8-9 August 1942, resulted in the sinking of one Australian and three US Navy cruisers, with the Japanese sustaining only light damage in return. In his after-action report, Adm. Richmond Kelly Turner, commander of US Naval amphibious forces in the Pacific, observed the following:

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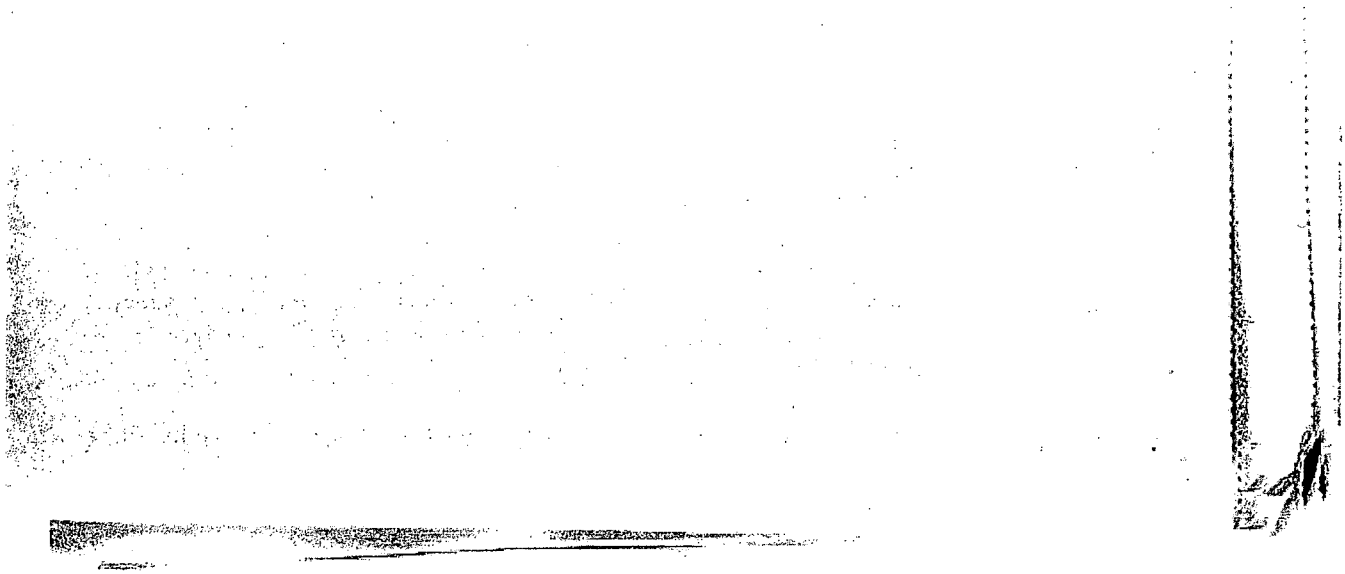
"... The [US] Navy was still obsessed with a strong feeling of technical and mental superiority over the enemy. In spite of ample evidence of enemy capabilities, most of our officers and men despised the Japanese and felt themselves sure victors in all encounters under any circumstances. The net result of all this was a fatal lethargy of mind, which induced a confidence without readiness and a routine acceptance of outworn peacetime standards of conduct. I believe that this psychological factor, as a cause of our defeat, was even more important than the element of surprise."



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(U) Checklist 2
A Checklist of Key Warning Indicators

(U) Cynthia Grabo, a leading DOD warning officer during the Cold War, boiled down her extensive research on strategic warning into the following five risk factors for surprise attacks: (b)(3)

☐	**Intentions:**	(U) Is the actor committed to some goal that could put it in conflict with another power or actor? Is pursuit of that goal tantamount to a national, political, or ideological obsession? (b)(3)
☐	**Feasibility:**	(U) Is that objective obtainable via military or coercive means, at least under certain optimal circumstances that the potential actor thinks achievable? (b)(3)
☐	**Capabilities:**	(U) Does the actor currently possess the coercive capabilities to achieve these objectives or is it making an intensive effort to achieve those capabilities? (b)(3)
☐	**Options:**	(U) Do other options exist short of military or coercive means to achieve the objectives? (b)(3)
☐	**Perceived risk:**	(U) Is the risk deemed acceptable or, at least, tolerable to the potential actor contemplating surprise? (b)(3)

(U) These five risk factors can be condensed into two sets of questions that analysts and IC teams can pose regarding potentially hostile actors in their areas of responsibility.

☐	**(1) Goal fixation:**	(U) Is the presumed objective prompting the possible use of hostile action a national obsession? Examples of national goal fixation include France's desire to regain the lost provinces of Alsace and Lorraine from Germany before World War I or Josef Stalin and Nikita Khrushchev's desire to weaken the West's ties to Berlin in 1948-61, before the construction of the Berlin Wall. (b)(3)
☐	**(2) Mobilization:**	(U) Is the actor exerting maximum effort to develop and mobilize the military or coercive means to achieve these objectives, such as the Vietnamese communists did during the Indo-China wars or as nuclear powers did before they acquired usable atomic weapons? (b)(3)

(U) Note: From Anticipating Surprise: Analysis for Strategic Warning (pp. 100-103), by Cynthia M. Grabo, 2004. (b)(3)

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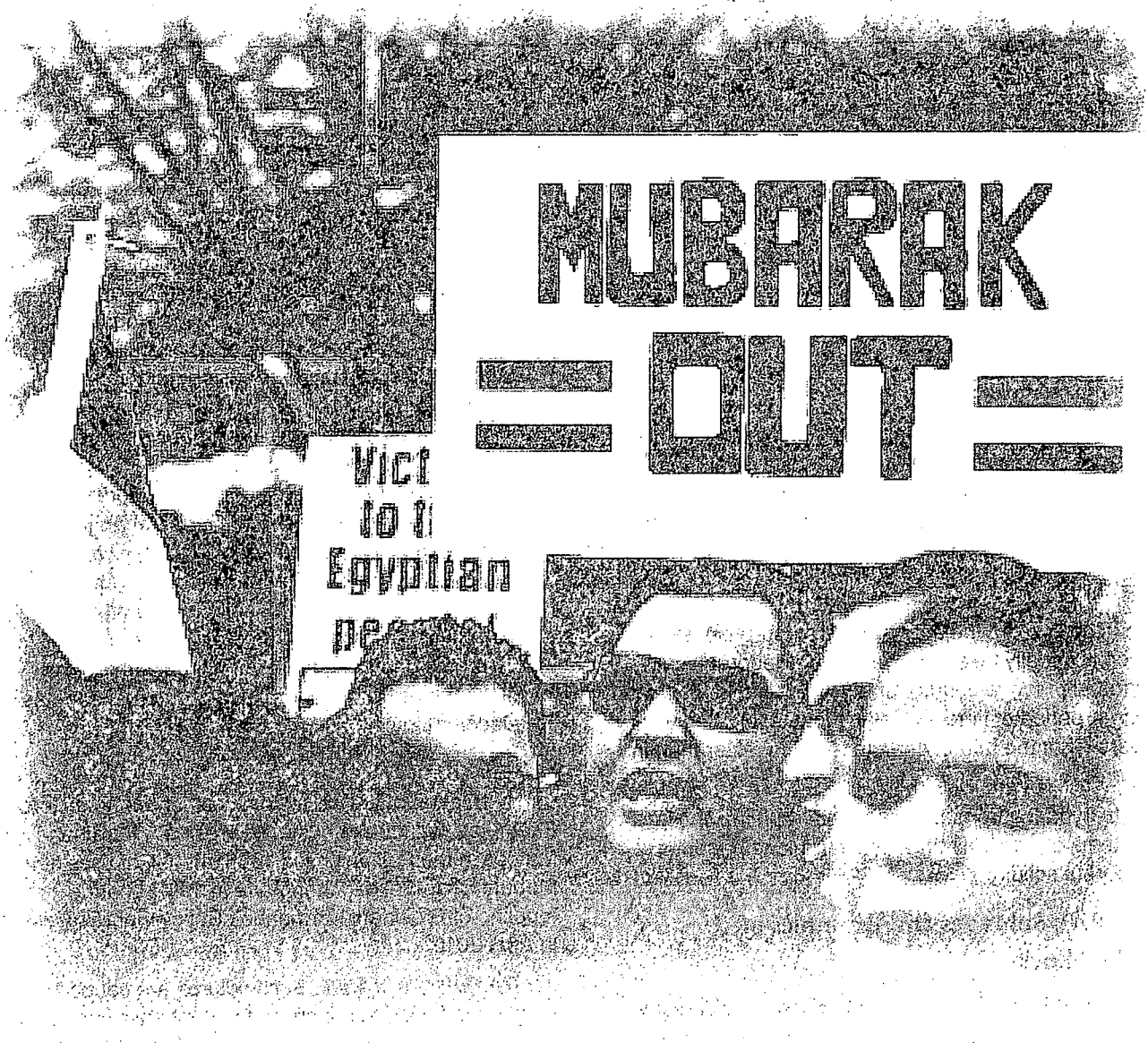
Type II Surprise:

SYSTEM SHOCK



Demonstrators demand the ouster of Egyptian President Hosni Mubarak.

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Type II Surprise: System Shock

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System shock involves the abrupt failure or rapid transformation of one or more complex systems. It includes sudden transitions from stability to instability, from order to disorder, from boom to bust. In Type II surprise, the focus is not on any unified actor but on a system or set of systems (see figure 5).

- A system can be a nation, a political arrangement, a country or regional economy, or a multi-ethnic community.
- It can also be a multilateral organization, alliance, or empire, such as communist Yugoslavia or the Soviet bloc during the Cold War.

The action in Type II surprise is the result of manifold human actions and reactions, but the outcomes are not the result of design by any one actor.

- In contrast to the action in Type I surprise, system shocks usually take place in a more geographically diffused place (a country or a region) in a somewhat longer period of time—weeks, months, or even years—but the rate of change is much faster than in "normal times."
- In Type II surprise, once-stable regimes and systems can quickly unravel after a long period of apparent solidity.

Subtypes and Examples of System Shock

The Overthrow of a Government. Such shocks result in to the ouster of a political leader, rather than the transformation of the social, political, or economic order. Examples include the ouster of President Ferdinand Marcos in the Philippines in 1986, the fall of President Mobutu Sese Seko in then Zaire in 1997, and the toppling of President Kurmanbek Bakiyev of Kyrgyzstan in April 2010.

The Failure of a State. Such failures are caused by the state's weakness and inability to adapt after one or more shocks, such as acute sectarian or ethnic strife. Such state failures are often associated with widespread social dislocation and hardship as well as with other types of system shock, including revolutions and civil wars.

- Examples include Afghanistan during 1992-96 and 2001-02, Somalia during 1991-2004, the Democratic Republic of the Congo in 1997-2002, Bosnia in 1992-95, and Lebanon in 1975-90.

Defining a Complex System

A complex system can be defined as any whole or entity consisting of diverse, interdependent, interacting components that exhibit properties not evident in the behavior of the individual members—a trait known as emergence. Relationships among the parts contain both negative (dampening) and positive (amplifying) feedback loops. They are nonlinear, which means a small disturbance of the system may result in big changes (the so-called butterfly effect),[h] a proportional change, or no change at all, depending on particular conditions, which makes prediction even more difficult. Examples of complex systems include ecological communities, economies and social structures, global climate, living organisms, regional and global strategic relationships, and modern infrastructures, such as telecommunications or energy.

[h] The term "butterfly effect" is one of the terms used to describe sensitive dependence on initial conditions in chaos theory. The term gained popularity after its use in the early 1960s by mathematician and meteorologist Edward Lorenz, who used it to explain the drastic, nonlinear changes in weather forecasts generated by his computer model of weather patterns. Lorenz attributed these large differences in forecasts to slight variations in his initial model settings, which he surmised could be caused in the real world by the flapping of a butterfly's wings.

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Figure 5
Anticipating System Shock

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Abrupt failure or transformation of a complex system or set of systems (such as a state, empire, or economy)

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Archetypes

- (b)(3) Fall of the Shah of Iran in 1978-79
- (b)(3) Collapse of communism in Eastern Europe and Soviet Union in 1989-91
- (b)(3) Ouster of Egyptian President Hosni Mubarak in 2011

Essence

- (b)(3) Rapid transformation of a complex system or systems—a state, economy, or international organization—or the rapid failure of a maladaptive system (an empire, an alliance, or a war effort)

Subtypes

- (b)(3) Ouster of a longtime political ruler
- Revolution
- Outbreak of civil war or secessionist movement
- Outburst of communal violence
- (U) Depression
- (b)(3) Supply shock, such as the OPEC oil embargo of 1973-74
- Financial panics and hyperinflations

Barriers to Perception

- (b)(3) System complexity, chaos, and randomness
- Inherent unpredictability of the tipping points that lead to nonlinear changes—the butterfly effect
- (b)(3) Observer's tendency to make straight line extrapolations
- Difficulty of timing the onset of a system shock

Analytic Concepts/ Analogies

- (b)(3) Apply complex systems analysis, focusing on identifying feedback loops, possible triggers, or catalysts for change
- Brainstorm possible "black swans"—wild cards that would impose system shifts
- (b)(3) Foster acute sensitivity to anomalous occurrences, data outliers, incongruities; anticipate inflection points
- Anticipate predictable surprises—crises caused by system unresponsiveness to identifiable problems, such as growing debts and deficits or to deteriorating environmental conditions
- (b)(3) Employ far-domain analogies—such as phase transitions, avalanches, or earthquakes—to examine possible tipping points

(b)(3) Source: Based on a review by a senior CIA analyst of more than two dozen cases of intelligence surprise experienced by US, British, French, Israeli, and Soviet services between 1939 and 2010.

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US Embassy personnel in Tehran—taken hostage by Iranian militants shortly after the fall of the Shah of Iran—are paraded in front of photographers. The collapse of the Shah's regime in 1979 demonstrates the rapidity with which system shocks can occur, as well as the lasting effects that such shocks can inflict on a wider region for years and decades to come.

The Onset of a Revolution. Revolutions that sweep away an entire sociopolitical order and replace it with something different are rare. They include the revolutions in Russia, China, and Cuba; the uprising against the Shah of Iran and the emergence of an Islamic state in 1978-79; the breakup of the Soviet empire in 1989-91; and the dismantlement of the apartheid system in South Africa in the early 1990s.

A Severe Recession or Grave Economic Calamity. In the economy, a system shock can originate in a specific market—the stock market, real estate, the financial sector, a fast-growing industry—and spread to an entire national or regional economy. The initial shock can be induced by an asset bubble that bursts or by a physical disruption of critical supplies because of war, embargoes, or labor trouble.

- Examples include the Great Depression and, on a lesser scale, the global financial crisis. The twin oil shocks of the 1970s—caused by pricing policy of the OPEC oil cartel after the Arab-Israeli war of 1973 and the Iranian revolution of 1978-79, respectively—are examples of supply-origin shocks.
- Environmental catastrophes—such as the accident at the nuclear plant in Chernobyl, Ukraine, in the USSR in 1986—or famines[i] because of natural disasters, poor land use, or inept state policies can also trigger system shocks.
- Poor central bank management of the money supply can lead to hyperinflations, such as the one that plagued Weimar, Germany, during the early 1920s or Zimbabwe in the 2003-08 period. (b)(3)

The Outbreak of Communal Violence. The outbreak of communal violence may illustrate system shock if it is primarily because of an unplanned flareup of longstanding social or ethnic tensions sparked by a random clash or incident, rather than to premeditated action by states or armed groups, which may choose to exploit the outbreak of communal violence as a pretext to further their goals. (b)(3) (b)(3)

- Examples of communal violence[j] include intermittent Hindu-Muslim violence in India, the Uighur-Han Chinese violence in mid-2009, the anti-Uzbek riots in Kyrgyzstan in 1990, and the anti-Chinese riots in Malaysia in 1969. Such riots are usually localized and rarely lead to state-backed genocide. (b)(3) (b)(3)

The Collapse of an International Organization or Alliance. The breakdown of an international organization or alliance under mounting duress—unless it is the direct result of hostile military action—is also an example of system shock. (b)(3)

- Some military alliances—the World War II "Grand Alliance" that defeated Nazi Germany, for example—break up because they achieve their immediate objective and then the member-states fall out over postwar security arrangements. (b)(3) (b)(3)
- Others, such as the Soviet-dominated Warsaw Pact, crumble to the result of dramatic changes in regime type or collapse of the dominant member. (b)(3) (b)(3)
- Still others fall victim to irrelevance and poor leadership, such as the Southeast Asia Treaty Organization in the 1970s. (b)(3)

Barriers to Early Perception of Type II Surprise (b)(3) (b)(3)

There are two key barriers to early perception of Type II surprises, which tend to be obscured mostly by the unpredictability and uncertainty inherent in complex affairs, rather than by the secrecy of hostile actors. (b)(3) (b)(3)

Real-World Complexity, Chaos, and Chance. Tumultuous events that engulf participants and onlookers alike—such as revolutions, state failures, the breakup of empires, and financial crises—result from the unceasing interplay of countless diverse variables, most of which are interdependent. The longer the list of (b)(3) (b)(3)

[i] Famines caused by state actions that are motivated by ideological ambition, such as the large-scale Ukrainian famine of 1932-33 (early in Josef Stalin's rule) or Mao Zedong's Great Leap Forward in 1958-61, are more akin to Type I surprise—sudden hostile action—in their origins and in their effects on the victim population.

[j] Communal violence includes ethnic, tribal, linguistic, or religious disturbances that involve violence or the threat of violence and damage to property.

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Patterns of Financial Bubbles: One Economist's View

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(b)(3) "The features of . . . manias and financial crises are never identical, and yet there is a similar pattern. The increase in prices in commodities or real estate or stocks is associated with euphoria; household wealth increases and so does spending. There is a sense of 'We never had it so good'. . .

(b)(3) . . Rational exuberance begins to morph into irrational exuberance, economic euphoria develops and investment and consumption spending increase. There is a pervasive sense that it is 'time to get on the train' . . . Asset prices increase further. The seers in the economy forecast perpetual economic growth and some venturesome ones proclaim no more recessions—the traditional business cycle . . . is obsolete.

(b)(3) . . . An increasingly large share of the purchases of these assets is undertaken in anticipation of short-term capital gains and an exceptionally large share of these purchases is financed with credit . . . Then the asset prices peak, and then begin to decline . . .

(b)(3) . . The decline in the prices of some assets leads to the concern that asset prices will decline further and that the financial system will experience 'distress.' The rush to sell these assets before prices decline further become self-fulfilling and so precipitous that it resembles a panic . . . The implosion of a bubble has been associated with declines in the prices of commodities, stocks, and real estate, and often these declines have been associated with a rash or a financial crisis. Some financial crises were preceded by a rapid increase in the indebtedness of one or several groups of borrowers rather than by a rapid increase in the price of an asset or security."

(b)(3) —Charles P. Kindleberger in *Manias, Panics, and Crashes: A History of Financial Crises*, 2005—three years before the 2008 financial crisis.

(b)(3) Economic analysts can assess the resiliency of an economic system's financial sector, monitor early indicators of rapid inflation in assets prices, and brainstorm the broad economic, political, and social consequences if an asset bubble were to burst.

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Anticipating Irrationality?

An economic expert on financial crises, Charles P. Kindleberger, once listed some phraseology historically applied to speculative bubbles:

"... Manias ... insane speculation ... blind passion ... financial orgies ... frenzies ... feverish speculation ... wishful thinking ... intoxicated investors ... turning a blind eye... a fool's paradise ... overconfidence ... overspeculation ... overtrading ... a raging appetite ... a craze ... a mad rush to expand."

Economic analysts have to be alert to occasions when the strongly positive feedback loops associated with the early stages of a bubble develop, resulting in "herd behavior" that belies assumptions about rational economic actors.

actors and factors at play, the harder it is for observers to disentangle causal relationships or distinguish between clues that are relevant ("signals") and those that are not ("noise").

- Frequently, the causes and effects of accelerating instability blur when one variable—such as economic performance—is so tightly linked to other variables, including labor peace, tax revenues, welfare state outlays, and political stability.
- Natural disasters, accidents, blunders, weather, and chance further complicate strategic foresight by adding a bewildering element of randomness.

Straight Line Extrapolations. Historical studies of intelligence failures and recent research into cognitive science both suggest that expectations that "tomorrow will look like today" are deeply rooted. Most human beings—including the foreign leaders and institutions that analysts monitor—have an ingrained need for order and predictability. On a day-to-day basis, analysts' expectations that any change in the short term will be modest and incremental will usually be borne out.

- Most organizations—state bureaucracies, militaries, political parties—generally try to maintain an orderly state of affairs and adhere to standard operating procedures. The customs and protocols of diplomatic relations and international organizations channel and contain quarrels via orderly procedures and established patterns of interaction.

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The Search for Universal Indicators of Political Instability

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Intelligence organizations and political scientists have long sought reliable indicators of looming political instability that are valid across systems and regions—so far with only modest success (see figure 6). Many experts deny such universal indicators even exist because of the importance of national and local idiosyncrasies and the sheer indecipherability of foreign actors. However, a contributor to the CIA journal *Studies in Intelligence* in the 1980s noted that, although the existence of reliable, truly universal indicators is doubtful, the presence of a youth bulge is often a common denominator of political instability.

- The author observes that young people are generally more volatile than older people, have less in the way of vested interests to lose, and are more willing to protest. Thus, "if in the relevant population [nation, city, or ethnic group], the youth bulge hits a certain [undetermined] high percentage, a major change becomes more likely." A youth bulge skewed toward young males, especially in poor countries, may be a particularly acute early indicator of sociopolitical instability.
- The same author notes the importance of monitoring possible breaches of "implicit promises and bargains"—expectations shared by the leaders and the led regarding minimally acceptable standards for national security and honor, domestic order, economic well-being, and state accountability. Breaches of such understandings can, under the right conditions, lead to a powerful backlash among hitherto acquiescent populations.

- Status quo–oriented leaders bent on keeping power have a vested interest in projecting an image of strength, steadiness, and invulnerability—an image that may influence both the local populations and the IC analysts observing them.
- Taken together, these factors often buttress analysts' status quo assumptions, even as system volatility is increasing.

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Figure 6

Triggers of Instability: The Importance of Precipitating Events

A trigger of political instability can be any catalyzing event that prompts significant numbers of once apathetic or intimidated citizens to take action against a government. Such triggers can take a wide variety of forms, depending on regime type, culture, popular grievances, and the state of civil society. Such triggers are usually unpredictable, driven by tactical conditions, and not always unobservable to outsiders—especially foreigners. Most governments can usually ride out one or two such triggers, unless they happen in rapid succession or the regime botches its follow-up response, resulting in a radicalization of once apathetic citizens.

Type of Trigger	How It Can Destabilize a Political System	Degree of Predictability
Bold, symbolic act of protest	(U//FOUO) Taps into people's sense of injustice; inspires potential oppositionists to take action.	Very low. Response is situation dependent.
Snowballing local protest	Destabilizes regime; stretches or strains local security forces; may provoke bloody government crackdown.	Very low. Response is situation dependent.
Elite defections and power grabs, including coups	Undercuts narrative of government unity, invulnerability; distracts leadership.	Very low. Coup plotters depend on secrecy for success.
Natural or civil disaster	Botched or ineffective response exposes weak state capacity, ineptitude, or indifference of leaders.	Low. Some weather-related disasters or earthquakes are more predictable in terms of general location, vulnerability.
Declining health, sudden death of leader	Impedes government's ability to act and react; raises doubts about leadership succession rules and country's future; may prompt ambitious rival elites to take action.	Moderate. Leaders tend to conceal ill health, but general effects of age and some diseases are predictable.
Rigged or stolen election	Exposes government's lack of legitimacy; galvanizes people to take to streets; may provoke external criticism or sanctions.	Moderate. Presence of experienced NGOs in some countries makes it harder to hide.
Worsening economic conditions because of perceived government mismanagement	Puts welfare and livelihood of citizenry at risk; may increase sense of desperation; reduces citizens' tolerance of elite corruption.	Moderate to high. Economic indicators or private sector actors may signal approaching tipping point.
Mismanaged war effort; national security fiasco	Exposes government's failure to fulfill its fundamental duty to protect the nation; strains civil-military relations; may reveal shortcomings of intelligence services.	Moderate to high.
Sharp increase in pressure from outside actors	Can demoralize elites and embolden outsiders; loss of foreign patron or the imposition of outside sanctions often follows internal weakening of regime.	Moderate to high. Foreign governments' statements and actions will often be observable.

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Aids To Anticipating Type II Surprise

Traditional intelligence sources are often of limited use in anticipating Type II surprise, because system shocks often result from cascades or "tipping points"—when a system transitions rapidly from apparent stability to instability—that not even the actors within the system can accurately forecast.

- Herd effects and reinforcing feedback loops can rapidly destabilize or shatter a once-stable system more quickly than the typical reaction times of traditional intelligence reporting and analysis cycles.
- Intelligence reporting that comes into the analyst's work station is "old" news. Whether it was collected only minutes, hours, months, or years ago, it provides a picture of what once was—not necessarily what will be.
- Analysts' long-established mental models and paradigms will no longer reflect the fast-changing situation on the ground, as a tipping point looms.

IC analysts could therefore benefit from supplementing scrutiny of intelligence reporting with other means to enhance strategic warning of system shocks. These approaches and concepts focus on improving analytic anticipation of system shocks by:

- Assessing the potential brittleness and fragility of apparently stable systems.
- Enhancing awareness of the signs of rapid change in complex systems.
- Applying far-domain analogies from other fields, particularly the sciences, to anticipate phase transitions in intelligence targets.
- Widening the range of imaginable outcomes.

Anticipate System Shifts and Tipping Points. There is a growing body of scholarly and popular literature on the dynamics of nonlinear change in various domains. In journalism, academia, and intelligence, the use of such terms as "tipping points," "phase transitions," and "black swans" have become widespread. Awareness of even the basics of complex adaptive systems—reinforcing feedback loops, snowball effects, herd behavior, nonlinearity—can help analysts get ahead of the curve, without waiting for hard intelligence to come in after the system shock has already occurred.

- Although sophisticated mathematical modeling is required to fully exploit the potential of complex systems analysis, even a qualitative, graphics-based approach to the actors and the feedback channels can help analysts map a system's interactions and assess its vulnerability to system shock.

On Black Swans

"Black swan" events—a term popularized by author and philosopher Nassim Nicholas Taleb in 2007—are extreme events outside the realm of popular expectations. They are difficult to model and carry heavy impacts, such as the rise of the Internet or the global financial crisis.

"Complex systems that have artificially suppressed volatility tend to become extremely fragile, while at the same time exhibiting no visible risks. In fact, they tend to be too calm and exhibit minimal variability as silent risks accumulate beneath the surface . . . These artificially constrained systems become prone to black swans—that is, they become vulnerable to large-scale events that lie far from statistical norms and were largely unpredictable to a given set of observers . . . catching everyone off guard."

—Essayist and philosopher Nassim Nicholas Taleb and scholar Mark Blyth in an essay from 2011 in *Foreign Affairs* magazine on the Arab Spring.

- Analysts can pursue a complex systems scoping analysis to identify the most important actors in a system, the basic rules for modeling actor behavior—such as maximizing profits for a company or bolstering security for a small country—and the system's most important and volatile networks.
- This assessment makes linkages explicit and highlights those situations when herd behaviors can intensify the effects of an initial perturbation in a once-stable system.

Employ Far-Domain Analogies. Analogies from the realms of engineering, medicine, and the sciences can help IC analysts conceptualize sudden dramatic departures from a seemingly stable equilibrium in the regions or issues they follow. Such analogies should not be transferred automatically across domains, but they can spur creative thinking about possible discontinuities in many analytic disciplines (see figure 7).

- For example, concepts such as the "butterfly effect"—originally derived from meteorological modeling—can illustrate the idea that small initial changes may produce nonlinear results (or sensitive dependence on initial conditions), such as was the case in Tunisia when a minor altercation between a fruit vendor and a low-level civil servant triggered the unrest that deposed strongman Ben Ali in 2011 after 28 years in power.

Continued on page 38

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Figure 7

Far-Domain Analogies: Aids To Anticipating Discontinuities

Concepts for rapid change from other disciplines or domains can help spur analysts thinking about the ways that discontinuities might crop up in the systems that they monitor. Simply brainstorming the types of "seismic forces" that may build up under an autocratic government, for example, can help analysts think creatively about the forms that a "phase transition"—a rapid transition from one state to another, from predictability to unpredictability—may take in their areas of analytic responsibility. Similarly, employing the analogy of "brittleness" from materials science to diagnose a maladaptive system—an alliance, an international organization, or an armed force under severe strain—may help analysts to think about system vulnerabilities in a new way.

Analogy	Original Domain	Helps Analysts to Better Understand:	Examples
Phase transition/critical transition	Chemistry/ Physics	Rapid shifts from one state to another, from stability to instability	Collapse of a regime, unraveling of an empire; such as the Soviet bloc or Yugoslavia
Structural failure	Engineering	Failure of subsystem or system to adapt to new stresses placed on it	Breakup of an alliance or international organization; such as the collapse of the League of Nations, SEATO
Cascading failure/"normal accident"	Engineering	Failure in a system of interconnected parts in which failure of a subsystem triggers failures in other system elements	Collapse of a maladaptive state or empire, such as the Warsaw Pact; the spread of a financial panic, such as occurred during the early period of the Great Depression
Contagion/ spillover effects	Epidemiology	Rapidly accelerating spread of behavior	Spread of financial panics, stock bubbles, pandemics, computer viruses, fads
Punctuated equilibrium	Evolutionary biology	Change in complex systems; long periods of equilibrium broken by rare events of large net magnitude	The evolution of the global balance of power, such as the system transition in postcommunist states
Earthquake/ avalanche	Geology	Sudden unleashing of formerly pent-up system strains or tensions, resulting in system shock and destabilization	Onset of a revolution that ousts the old regime; such as the revolutions in Russia or China
Brittleness	Materials science/ metallurgy	Latent weaknesses of a seemingly robust system which suddenly become apparent	Fragility of a long-entrenched political system, such as communist rule in Eastern Europe and the Soviet Union or of secular dictatorships in Egypt and Tunisia before 2011

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Figure 7

Far-Domain Analogies: Aids To Anticipating Discontinuities (Continued)

Analogy	Original Domain	Helps Analysts to Better Understand:	Examples
Butterfly effect/Snowball effect	Meteorology	Small initial changes that lead to large variations in long-term conditions	Technological innovation and diffusion; crisis escalation
Perfect storm	Meteorology	Rare combinations of destabilizing events that aggravate a situation or crisis	Onset of World War I; technological disasters such as the Chernobyl nuclear accident
Critical mass/ chain reaction	Physics	Threshold number of people or agents to trigger a self-sustaining phenomenon	Spread of the Internet, computer use, social networking media; regional arms races; mass unrest
Tipping points	Popular sociology	Rapid accelerations in the rate of change or in the spread of ideas or practices	Rapid onset of a depression, major financial crisis, regime collapse
"Black swans"/wild cards	Popular sociology	"Random" or extreme, hard-to-predict shocks	Assassinations; extreme terrorism; onset of World War I; diffusion of disruptive technologies
Herd behavior/ demonstration effects	Zoology/ sociology/ psychology	Rapid imitation or copied behaviors, beliefs, coordinated group behavior without planned direction	Spread of financial panics, stock bubbles, ideological currents, spread of communal violence

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- The term "contagion," originally from epidemiology, is often used to describe the spread of financial or political instability from one country or region to areas previous thought stable (immune) from such volatility.

"Brittleness"—a concept borrowed from materials science—can be applied to political systems that have endured over time but that may yet be vulnerable to unforeseen shocks. This far-domain analogy is particularly applicable to personalist authoritarian states that have not adapted to social or technological changes and that may be vulnerable to swift overthrow if a political challenge arises suddenly or from an unseen direction. Analytic teams can brainstorm the pillars of traditional authority in the countries or institutions that they follow and examine the relative degree of brittleness of each pillar, over time.

APPLICATION

Analysts can list or brainstorm in small groups the possible discontinuities that may loom in their areas of analytic responsibility. Using a handful of far-domain analogies for massive discontinuous change—earthquakes, perfect storms, "black swans," phase transitions—can spur creativity. Such metaphors for big change can help analysts get past status quo assumptions and dispel entrenched mind-sets regarding the permanence of only linear or evolutionary change. For example, analysts might regularly ask the following questions:

- What sorts of fault lines exist in my area of analytic responsibility—such as the aspirations of a rising social class versus the power and privileges of an entrenched autocratic ruler, the enduring enmity between two ethnic or religious groups, or the irreconcilable goals of two parties locked in an enduring strategic rivalry?
- With these fault lines in mind, what keeps the lid on? How strong are those forces for restraint? Might these inhibitors be weakening?
- What factors might bring those latent antagonisms into open conflict? What might make an "earthquake" more likely? What might trigger a catastrophic event?
- What might happen after such a catastrophe occurs? The discussion should include the nonobvious, indirect, and long-term effects, as well as the more immediate, likely, or obvious ones.

Conduct War Games or Crisis Simulations. Apart from their utility in assessing the risks of sudden hostile action, these exercises can also help analysts game out a complex sequence of events. A war game or simulation is a technique designed to model—either rigorously or creatively—the operations and responses of a real-world process, organization, or system over time. No other tool is as helpful in scoping the dynamics and in bounding the imaginable outcomes of multiple interactions among many interdependent actors, such as those precipitated by the launch of a separatist movement or the escalating tensions caused by a radical state on the brink of acquiring nuclear weapons.

- Academic studies—amply supported by centuries of military experience with simulations—demonstrate that no other method consistently provides players with a more realistic sense of the volatility, time pressures, perceptions, and risks of unexpected moves by actors in a strategic game environment.
- Simulations can also provide players with a laboratory to challenge assumptions, test the readiness of actors for escalation and discontinuities, and explore the effects of randomness, friction, and wild cards on crisis scenarios.

APPLICATION

As a historian of technological failures, Charles Perrow in the 1980s examined **"normal accidents"**—his term for the "inevitable" failures of tightly coupled technological systems, such as nuclear power plants, space vehicles, and oil rigs. Other analysts of technological systems speak of **"cascading failure."**

- Perrow's concepts can be applied to complex political and economic systems, such as the EU, the Chinese Communist Party, or the global financial system.
- Analysts planning a simulation can ask, "What are the 'normal accidents' waiting to happen?" in their areas of analytic responsibility—such as the inability of a stagnant authoritarian system to manage a serious economic downturn. They can then examine what other systems—economic, security, or military—may be at risk of spillover effects should the political system fail.

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) ***Identify and Monitor Breached Social Contracts.*** Just as deep understanding of a potential foe's strategic red lines is critical to assessing the risks of a surprise attack, so is awareness of informal social contracts—the unwritten expectations of accountability and obedience between the rulers and the ruled—critical to the assessment of political stability.

- Implicit promises and bargains are key elements of political stability. Such understandings limit uncertainty and set ground rules, according to one intelligence officer involved in instability analysis. When a social contract is breached, it creates preconditions for political instability.
- Examples of such breaches might include blatant electoral fraud, a policy blunder, flagrant corruption, scandalous conduct by an unpopular member of an autocrat's inner circle or family, or unprovoked violence against unarmed protestors, especially if such breaches are captured in visual media that can be disseminated widely.

APPLICATION

Periodic reviews of the terms of various country-specific social contracts and of possible signs of a violation may tip off political analysts to an erosion of legitimacy that often precedes a political system shock.

- Analysts can ask, "Is country X now breaking an implicit social contract, or is it likely to do so in the near-term future?"
- Seasoned substantive experts are the best sources for identifying the terms of implicit promises between the leaders and the led and for assessing the indicators of a possible breach.

Conduct "What If" and High-Impact Scenario Analyses. Well-crafted scenarios and alternative futures can also help analysts move beyond near-term tactical assessment and straight line extrapolation. Academic postmortems of various intelligence failures often point to the penchant for single-point predictions—often anchored around the yesteryear's status quo—as the bane of sound strategic foresight. Well-depicted scenarios that are based on valid key drivers and fleshed out by multidisciplinary experts can widen readers' range of imaginable outcomes. (b)(3)

APPLICATION (b)(3)

"What If" analysis involves postulating that a possible discontinuity has already occurred. This allows analysts to sidestep irresolvable debates over the likelihood of the event and focus on the possible drivers, proximate causes, and signposts of the postulated event. Analysts can work backwards to envision one or more plausible paths to the event and reason forward to assess its direct and indirect implications. (b)(3)

High-impact scenario analysis is similar. It allows analysts to move beyond status quo assumptions and expectations of small-scale change and focus on the more worrisome discontinuities that could be looming, the probabilities of which are generally thought to be low but are actually uncertain or variable. (b)(3)

Daisy Chains of System Shocks (b)(3)

Unlike in the physical world, a shock in the realm of human affairs does not typically result in a swift return to a stable, if drastically altered, new status quo. Instead, system shocks often lead to relatively long stretches of grinding instability and unpredictability, as various actors try to comprehend and cope with new conditions, exploit or resist opportunities for further change, and pick their way amongst the ruins of the old order. Major wars, widespread regional unrest, and the falls of empires are notorious for ushering in years and decades of heightened instability in their turbulent wake. Analysts working such intractable circumstances should have little expectations of a rapid return to preshock normalcy or stability. (b)(3)

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Type III Surprise:

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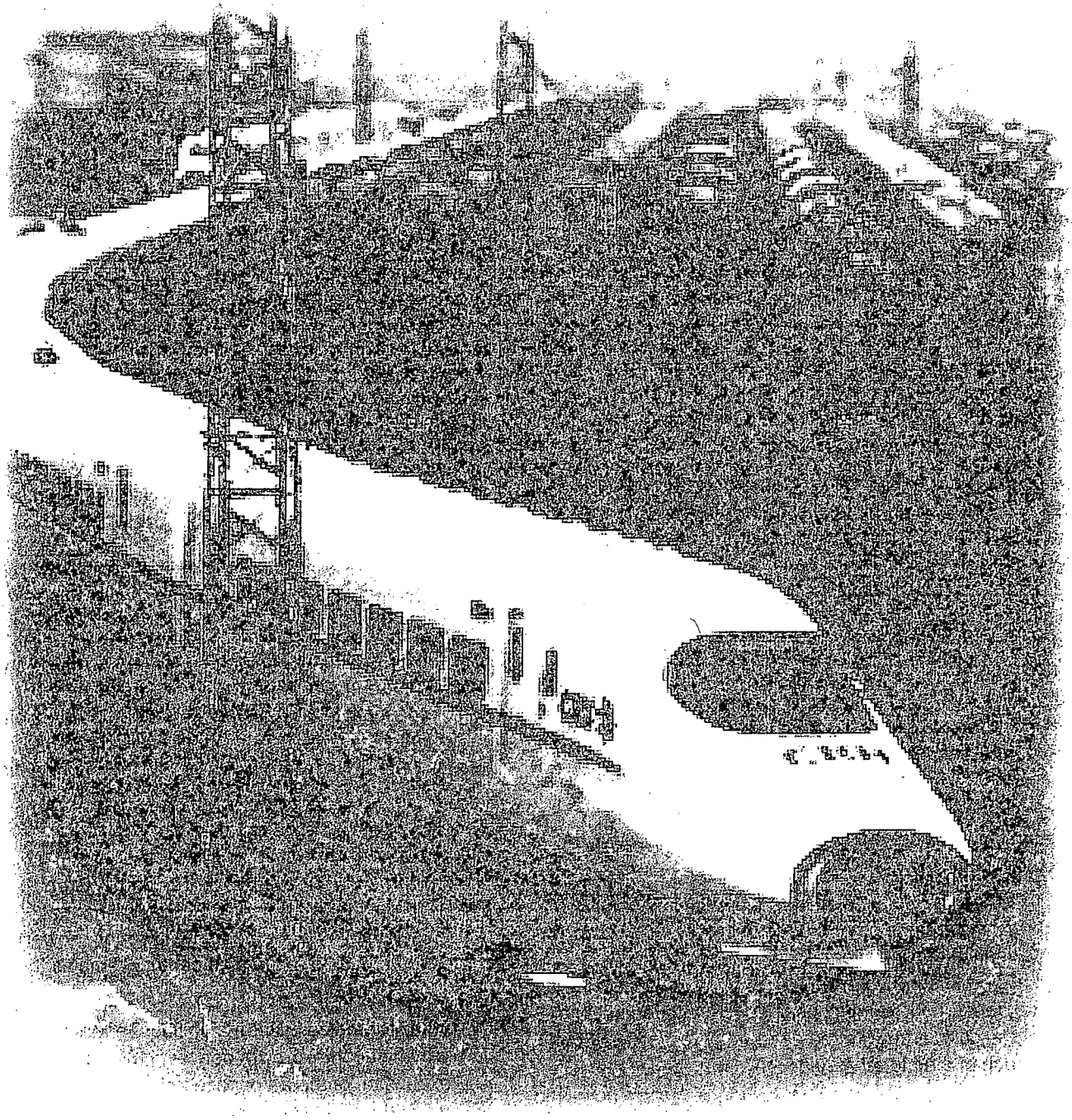
TECTONIC TRANSFORMATION



A Chinese high-speed train makes its way toward the main line.

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Type III Surprise: Tectonic Transformation

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Tectonic transformation involves the alteration of an entire domain or region, such as a continental economy, a regional military balance, a belief system, or technological network. Unlike sudden hostile actions or system shocks, tectonic transformations are not discrete events but extended historical processes, often lasting years or decades (see figure 8).

- They do not involve sudden or immediately obvious change, but rather large-scale, cumulative evolutionary changes that transform with gathering momentum entire domains, along with the strategic, political, and economic systems therein.

In Type III surprise, the main actor is a national, regional, or global system—such as the industrialized Western economies or the global security system—made up of a huge number of interdependent actors that include people, societies, states, and institutions, none of whom control the domain. The engine of change—for example, the emergence of a revolutionary new technology, a compelling new ideology, or a new global power—drives the gradual but deep-rooted transformation of politics, society, economic life, and military affairs.

- In Type III surprise, the surprise is usually not the main driver of change itself but rather the social, political, economic, and military consequences of that driver.
- The widely distributed, cumulative nature of tectonic change often eludes observers, including intelligence organizations. The changes associated with Type III surprise are usually imperceptible at first and then deceptively inconspicuous—"hidden in plain sight"—compared with the day-to-day "crises" featured in much of the global media.

Subtypes and Examples of Tectonic Transformation

Economic Transformations. Sustained, accelerated improvements in tools, technologies, and techniques vastly increase long-term labor productivity and overall productive capacity. These gains, in turn, permit large jumps in living standards, food production, public health, state capacity, and military potential. These transformations are invariably linked to dramatic changes in business organization, working conditions, and producer-consumer relations. Over time they also transform politics, societies, and education.

- The Industrial Revolution that began in Great Britain in the middle of the 18th century and that made the United Kingdom the world's most powerful state by the middle of the next century remains the leading example.
- Other examples include a unified Germany's explosive industrial growth between 1870 and 1914, the expansion of the aerospace industry in the United States between 1930s and early 1970s, the global revolution in information technologies since World War II, and China's meteoric economic ascent since 1979.

Strategic Inflection Points

(b)(3)

> "(U) What is an inflection point? Mathematically, when the rate of change of the slope of the curve (referred to as the second derivative) changes sign, for instance, from positive to negative. So it is with strategic matters, too. An inflection point occurs where the old strategic picture dissolves and gives way to the new . . . when the balance of forces shifts from the old structure, from the old ways of doing business . . . to the new. When exactly does a strategic inflection point take place? It's hard to pinpoint, even in retrospect."
>
> —Former Intel CEO Andy Grove in *Only the Paranoid Survive*, 1996

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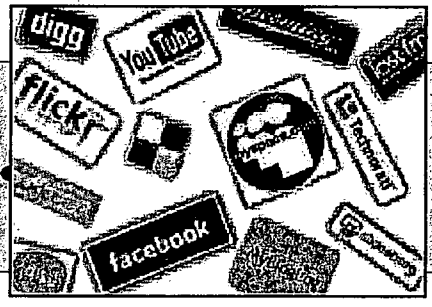
Figure 8 (b)(3)

Anticipating Tectonic Transformation[a]

(U) *Sweeping changes in regional or global domains (such as an interstate system, ideologies and religions, societal mores, technology, or economy)*



Archetypes	• (b)(3) China's economic transformation since late 1970s • Growth of civil rights, human rights movements • Rise of the World Wide Web, Internet, surge of social media • (b)(3) Emergence of political Islam
Essence	• (b)(3) Extensive long-term changes, fundamental alterations of core technologies, economic systems, demographic patterns, political allegiances, or ideologies—often culminating in an epiphany, an event that exposes the sweeping scale, significance of change
Subtypes	• (b)(3) Industrial revolutions • Economic transformations • Emergence of new powers, decline of old ones • Rise or fundamental changes of political ideologies, religions; decay of old belief systems, such as Marxism-Leninism • (b)(3) Growth of social movements
Barriers to Perception	• (b)(3) The widely distributed nature of bottom-up change that is hidden in plain sight • The large scale of change—impossible for an observer to monitor in entirety • Scope, dimensions of change—too diverse, contingent to forecast accurately
Analytic Concepts/ Analogies	• (b)(3) Examine core system drivers; identify signature technologies; brainstorm their effects with wide network of interdisciplinary experts • (b)(3) Consider analogous historic precedents—employ "Thinking in Time" concepts of Richard Neustadt and Ernest May • (b)(3) Apply most relevant far-domain analogies from science, medicine, or engineering, such as tectonic change, evolution • (b)(3) Generate scenarios to expand the range of imaginable future outcomes • Apply concepts of systems thinkers in politics (for example, Francis Fukuyama, Samuel Huntington), economics (David Landes, Douglass North, Joseph Schumpeter) and strategy (Robert Jervis, Thomas Schelling, Michael Howard, John Keegan, Paul Kennedy)

[a] (b)(3) In most instances, the driver(s) of tectonic change—technological or military innovation, economic expansion, and the rise of new powers or ideologies—will be widely known. However, the scale of the change and its effects on states, organizations, and societies will not be comprehended because the consequences are so widely distributed and their ramifications for strategy and politics are not understood or anticipated.

(b)(3) Source: Based on a review by a senior CIA analyst of more than two dozen cases of intelligence surprise experienced by US, British, French, Israeli, and Soviet services between 1939 and 2010.

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The Uneven Tempo of Tectonic Change

> "A good rule of thumb for many things in life holds that things take longer to happen than you think they will, and then they happen faster than you thought they could. Think, for example, of the widespread use of the e-book, or the coming home to roost of debt problems around the industrial world."
>
> —Economist Lawrence Summers

The Rise of New Great Powers.[k] The rise of new great powers—states that possess the means and will to influence events well beyond their borders—transforms strategy and diplomacy across continents and oceans and upsets old balances of power. States that significantly augment their political, military, economic, and cultural influence abroad force other powers and states to respond.

- Examples include the destabilizing rise of Germany after the wars of German unification in the 1864-71 period; Japan's uneven but rapid modernization in the decades after the Meiji Restoration in 1868; the USSR's rise as a superpower during and after World War II; and China's reemergence in the modern era, first as a unified land power in Asia under Mao after 1949 and then as a fast-growing great power with global economic reach since late in the last millennium.

The Emergence of New Ideological and Social Movements and the Transformation of Existing Ones. The rise of new ideologies and religious movements—such as Marxism in the 19th century and fascism in the early 20th century—or the metamorphosis of existing ones, such as the rise of a more politically assertive Islam since the 1960s or the rise of feminism in the West, transforms politics across countries and regions. Such movements—often fueled by anti-establishment zeal—threaten status quo politics, traditional cultural values, and established institutions. (b)(3)

- When political groups that espouse new or transformed belief systems come to power, such as occurred after Fidel Castro seized power in Cuba in 1959 or after the fall of the Shah of Iran in 1979, they will often challenge foreign powers or elicit hostile reactions from status quo–oriented neighboring states.
- Alternatively, the reemergence of liberal-democratic values in Central Europe—after more than a half-century of nationalist authoritarianism and then communist totalitarianism—led to the rapid dissolution of the Soviet bloc and the Warsaw Pact and the enlargement of the EU and NATO in the decades that followed.[l]

Revolutions in Military Affairs. Sweeping changes in military technologies, tactics, organization, and doctrine drastically alter old power hierarchies, increase strategic uncertainty, increase the risks of miscalculation, and sometimes heighten the temptations of military "solutions."[m] Revolutions in military affairs (RMAs) force the militaries of other powers to adapt and respond—sometimes in ways destabilizing to the regional balance of power.

- The main driver can be a new technology—as was the case with nuclear weapons or ballistic missiles during and after World War II—or new methods of raising, organizing, and equipping armies, such as occurred in Western Europe and the United States in the 19th century.
- Examples of RMAs include the emergence of mass conscript-based national armies in the West in the 19th century, the adoption of tanks and the mechanization of land forces in the first half of the 20th century, the rise of naval aviation in the interwar era, and the spread of nuclear weapons and the means to deliver them over long distances since 1945.
- Discussions of the latest RMA center on the integration of advanced intelligence, surveillance, communication, and precision-strike systems—first on display in a dramatic way during the first Gulf war of 1991—and now buttressed by stealth technologies, unmanned systems, and cyber weapons.

[k] The fall of old or established powers could also be included in this section. Most political scientists assess, for example, that the USSR's demise was the result of a protracted deterioration in its political dynamism, ideological appeal, economic growth, and strategic competitiveness. These trends were compounded by public apathy, rising nationalism, and the policy mistakes of a moribund leadership—particularly, the disastrous decision to invade Afghanistan in 1979, which lead to an unpopular military quagmire. However, the final demise of declining powers is often sudden and dramatic, as were the collapses of the German, Austro-Hungarian, Ottoman, and Russian empires at the end of World War I. For this reason, their demise is categorized in this training aid as a system shock.

[l] The decay of old belief systems—such as monarchical rule, interwar fascism, Western imperialism, and Marxism-Leninism—can also be considered a tectonic change. In some cases, a policy debacle, particularly a defeat in costly war (France in Indo-China; the USSR in Afghanistan)—dramatically accelerates ideological decline. In other cases, ideological dissolution proceeds slowly, over decades, as was the case in Great Britain with the erosion of confidence in the imperial idea.

[m] There is a lengthy debate among strategists, scholars, military planners, and defense affairs pundits over the precise nomenclature, meaning, and implications of various revolutions in military affairs, particularly in the current context. This analysis sidesteps that discussion.

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Barriers to Early Perception of Type III Surprise

(b)(3) The daunting scale and scope of tectonic transformation and the press of more urgent short-term business can distract from the strategic effects of Type III surprises. Barriers to early perception include those that obscure system shock, including real-world complexity and the penchant for straight line extrapolations. In addition, analysts of Type III surprise also must see through the gradual, distributed nature of tectonic transformations. Although the main driver behind such changes will usually not be a surprise in and of itself, its multifaceted effects on other domains often will be.

(b)(3) ***Unfathomable Scale.*** The effects of tectonic transformation are widely distributed—geographically and across time. Such changes are virtually impossible for any one observer to monitor, comprehend, or forecast in their entirety. The gradual but sweeping changes that they bring about may be "hidden in plain sight," as Sherlock Holmes once observed about open clues that others had overlooked.

- (b)(3) For example, an industrial revolution will involve faster-than-normal gains in productivity and per capita GDP that are observable over time, but its effects—on society, state capacity, or a country's military power—will not be clear-cut at any given point in time. It took decades for the 20th century ideology of communism to emerge out of Marxism.

(b)(3) ***The Tyranny of the Short Term.*** The cumulative weight of incremental changes in technology, political beliefs, or societal change is often overlooked by harried analysts obliged to keep abreast of short-term, more urgent problems—such as election outcomes, ongoing wars, political instability, or summits of national leaders. In such cases, the urgent does crowd out the important.

- (b)(3) Intelligence organizations also face difficulties in gathering accurate "grassroots" information needed to comprehend the nature, scale, and implications of bottom-up change in foreign lands.

Aids To Anticipating Type III Surprise

(b)(3) Tectonic transformation involves changes over such a large scale and over a relatively protracted period of time that they are virtually impossible to keep secret, even in totalitarian societies. For this reason, traditional intelligence sources are of even less use in anticipating Type III Tectonic Transformation shifts than they are in anticipating Type II System Shocks. Instead, nontraditional information sources, multiple scenario-generation techniques, and various methods to model or simulate sweeping changes can help analysts comprehend the scale and scope of Type III Tectonic Transformation.

(b)(3) "Creative Destruction"—Nonlinear Change in the Realm of Economics

> "(b)(3) Capitalism . . . by its nature is a method of economic change that not only never is but never can be stationary. The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organization . . . that capitalist enterprise creates. . . . [This process] incessantly revolutionizes the economic structure from within, destroying the old one, creating the new one. This process of Creative Destruction is the essential fact about capitalism."
>
> (b)(3)—Economist Joseph A. Schumpeter in *Capitalism, Socialism, and Democracy*, 1942

(b)(3) ***Seek Multiframe Perspectives.*** Seeking opinions that are genuinely outside the mainstream—from emigres, local bloggers, or unheralded scholars steeped in a country's culture, language, and history—is a useful starting point for acquiring new perspectives on the effects of tectonic changes. Ground truths based on authentic voices of marginalized and persecuted groups—as opposed to insider knowledge from regime elites—are critical to understanding ever-changing grassroots political and social conditions. New information sources—including from various aggregators for social media content—can help analysts move beyond narrow, inbox-based reporting.

(b)(3) ***Conceptualize and Portray Diverse Alternative Futures.*** Long-term tectonic changes are so uncertain that they cannot be reliably modeled or predicted, but various techniques can help us think creatively about them. There are a variety of alternative futures development techniques. Most of these techniques focus on identifying the key drivers of change, the critical variables, the most important unknowns, and "wild cards"—possible shocks that could skew our forecasts—in order to sketch imaginable alternative futures. Scenarios are plausible stories about those futures that engage the reader and provoke questions about the readiness of decisionmakers and institutions to respond appropriately to large-scale change.

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The Value of "What If . . ." Scenarios

"The scenario process provides a context for thinking clearly about the impossibly complex array of factors that affect any decision. It gives [decisionmakers] a common language for talking about these problems, starting with a series of "what if" stories. What if our worst nightmare came to pass . . . or . . . our most desired future? What . . . unexpected challenges would it present to us? Or what if a completely unexpected series of events changes the structure of our [world]? Would we be overwhelmed, or would we see opportunities?"

— Futurist Peter Schwartz in *The Art of the Long View*, 1996

- *Scenario Response Planning.* Comprehensive examination of various risks and opportunities associated with different scenarios can expand decisionmakers' foresight in the face of uncertainty and surprise.

APPLICATION

Analytic teams can hone their strategic foresight by brainstorming a comprehensive list of variables that directly or indirectly influence their area of analytic responsibility, identifying the critical ones, and generating indicators for assessing the relative weight and direction of these variables that are both valid (they provide insight about the direction of that variable) and observable (a collector can gather data against it). Crafting a range of imaginable outcomes in the form of scenarios can help us picture a broader range of alternative futures that goes beyond mere straight line extrapolation.

Develop Agent-Based Models. Agent-based models (ABMs) that describe how agents interact and behave in a larger system can help IC analysts manage large numbers of interacting variables and iterative processes. ABMs are not limited by typical econometric assumptions, such as the belief that economic systems are inclined to revert to steady-state equilibriums. This feature makes agent-based models particularly useful in anticipating the point at which vulnerable systems—fragile economies, governments, coalitions—are ripe for sudden, nonlinear changes, such as price bubbles, herding, or stock market crashes. ABMs can also help analytic teams to explore the rules that govern actors' behaviors and to develop scenarios and signposts. These models can be supported with intuitive visualizations of the vulnerable systems and with social network or geospatial analysis.

Recognizing the Limits of Historical Analogies

(b)(3)

Historical analogies can serve as useful starting points for creatively thinking about possible discontinuities and surprises. However, they should be carefully scrutinized and matched with empirical signposts to test their validity and limits. In most cases, the dissimilarities will be more salient than the similarities of any two historical events.

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"The misuses of analogy are many and complex . . . Any intelligent use of analogy must begin with a sense of its limits. An analogical inference between A and B presumes that those two objects are similar in some respects but different in others. If there were no dissimilarities, we would have an identity rather than an analogy. Analogical inference alone is powerless to resolve the critical problem of whether any particular point is a point of similarity or difference . . . Let us hope that [analogies] will be developed with clarity, caution, and conscious reflection."

(b)(3)

— Historian David Hackett Fischer in *Historians' Fallacies: Toward a Logic of Historical Thought*, 1970

(b)(3)

(b)(3)

"Thinking in Time"/Employ Appropriate Historical Analogies. Analysts cannot conduct experiments to test hypotheses, but historical case studies and precedents can sometimes help them think through the underlying patterns of major historical change. Historical analogies that shed light on how current trends may play out can be a useful starting point in assessing tectonic changes. Rigorously comparing and contrasting the historical precedent with its current analogue will expose the weaknesses of some analogies and demonstrate the appropriate applicability of others. In doing so, analysts should always be mindful of the risks of misusing historical analogies and, if misapplied, their ability to distort perceptions of current situations.

(b)(3)

(b)(3)

Apply Concepts of System Thinkers. Analysts' efforts to be conversant with the ideas of the ablest system thinkers in their domains can help anticipate Type III surprise.

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- Examples of such system thinkers include Francis Fukuyama, Samuel Huntington, Robert Jervis, and Joseph Nye in political affairs; David Landes, Deirdre McCloskey, Douglass North, and Joseph Schumpeter

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"The Path to Folly"

(U) Historians Richard E. Neustadt and Ernest R. May, in their classic 1986 work, *Thinking in Time: The Uses of History for Decisionmakers*, note that the following missteps often result in the abuse or neglect of history in assessment and policy deliberations:

> "'Usual' practice, we fear, has six ingredients: a plunge toward action; overdependence on fuzzy analogies, whether for advocacy, analysis, or both; inattention to an issue's own past; failure to think a second time—sometimes even a first—about key presumptions; stereotyped suppositions about persons or organizations (stereotypes which could be refined but aren't); and little or no effort to see choice as part of any historical sequence."

in economic affairs; and Carl von Clausewitz, Martin van Creveld, Max Hastings, Michael Howard, John Keegan, Paul Kennedy, and Williamson Murray in military and strategic affairs.

- Such thinkers should not be regarded as infallible oracles, but their concepts can help put current issues in a strategic context, explain long-term historical trends, identify patterns, and spur creative thinking about the underlying forces and key variables in analysts' areas of responsibility.

In assessing foreign actors, analysts can expect foreign leaders to use and misuse historical precedents and analogies in their quest to comprehend their world, to draw inspiration, and to legitimize their actions. Using Neustadt and May's framework, analysts can factor in such distorted historical perceptions into their assessments to help them anticipate various types of change caused by foreign leaders' misperceptions and miscalculations.

"Epiphanies" as Clarifiers of Type III Change—The Case of the Atomic Bomb

In some cases, a discrete, conspicuous event at the middle or end of the transformation—an epiphany—makes clear the cumulative effects of the change. Such events can be significant in their own right—and surprise outside observers—but they also make obvious how extensively the old order has been altered.

US development of the atomic bomb as a deliverable strategic weapon is a good example of an epiphany. US use of the atomic bomb against Japan in 1945 was a major case of military-technological surprise in its own right. However, it also made clear the consequences of a number of tectonic shifts in multiple domains, including:

- Revolutionary advances in modern physics and chemistry ushered in by an international community of scientists.
- The exodus from Europe to the United States of top-caliber scientists fleeing Adolf Hitler's anti-Semitic persecutions.
- The massive expansion of the US industrial base, aviation industry, and military technocracy as the result of the industrial revolution and two world wars.
- The increasing sophistication of US scientific and technological research capacity, rooted in the growth of unrivaled US universities, research facilities, and industrial laboratories.

US use of reliable precision-guided munitions in the war to eject Iraqi President Husayn's army from Kuwait in 1991 is another example of an epiphany. The accuracy, reliability, and deliverability of the munitions caught Iraqi forces unprepared and off guard.

- The demonstration of the revolutionary effectiveness of such weapons also made clear to other foreign militaries and intelligence services that that the United States possessed a huge lead in integrating modern intelligence, computing, navigational, and strike technologies that had been developed over decades into decisive military capabilities.
- The relative ease with which the US-led coalition ejected Iraq's army forced other states to respond, by modernizing their militaries and by developing unconventional and asymmetric responses to counter the dominant advantages of the United States in advanced conventional weapons.

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Checklist 3 (b)(3)

A Checklist on Improving Warning

- ☐ [redacted] **Tap colleagues' experiences and expertise** to help prioritize and categorize possible discontinuities. Engage senior analysts to compare/contrast current situations to possibly analogous situations in the past in which stability may or may not have eventually returned. (b)(3)
- ☐ [redacted] **Apprise managers** of distant dangers as early as possible. Explain why you think a possible discontinuity may merit closer attention, greater collection, and possible warning of the readership. Engage them in the warning process early on. (b)(3)
- ☐ [redacted] **Reach out to IC colleagues** from other components, agencies, and departments. Warn them of what you are seeing or what you think you might be seeing. Discuss why you may have differing assessments of looming discontinuities. Ask if they have alerted their superiors about them. (b)(3)
- ☐ [redacted] **Sound "intermediate" warning** if the discontinuity is uncertain. Timing is generally the hardest dimension to the problem of surprise. Instead, analysis that offers "intermediate" warning of changing system dynamics and increasing risks of volatility—buttressed by a vivid discussion of the implications for decisionmakers' interests—can prepare readers to adjust their strategic expectations for an issue or actor. (b)(3)
- ☐ [redacted] **Make it plain**—issue clear warnings as dangers loom. Do not obfuscate or bury your warning. Make it the centerpiece of the assessment. Use short declarative sentences to explain your thinking. Discuss the estimated timeline for looming dangers, knowledge gaps, the risks (and/or opportunities) should the discontinuous event occur, and offer constructive suggestions about possible levers or opportunities to avert or mitigate approaching dangers. (b)(3)
- ☐ [redacted] **Use arresting graphics** to communicate warning. Effective visualization makes a warning more persuasive and brings the possible risks and implications of a threat into sharper focus. (b)(3)
- ☐ [redacted] **Offer to brief the warning.** Busy decisionmakers may appreciate the opportunity to hear directly from the analysts in the IC about the nature and risks of approaching dangers and to pose questions, challenge assessments, and consider alternatives. If time does not allow, analysts can consider asking a supervisor to provide an oral warning to a key policymaker via the phone. (b)(3)

[redacted] (b)(3)

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Tear out along perforated edge for personal reference!

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[redacted] Other Techniques

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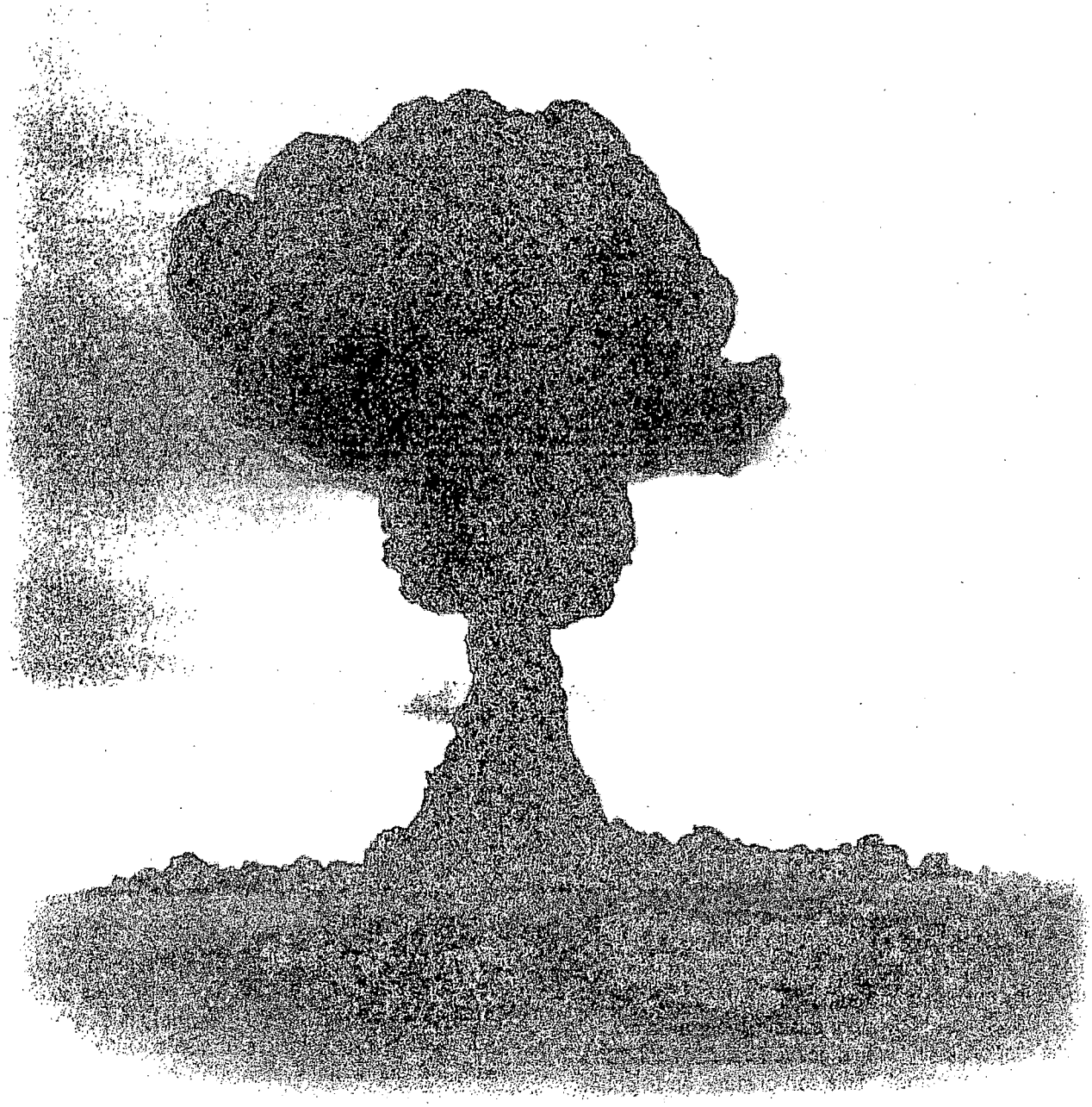

[redacted] *A mushroom cloud rises after the Soviet Union's first atomic bomb test on 29 August 1949 at the Semipalatinsk Test Site in Kazakhstan.*

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Techniques Helpful in Anticipating All Types of Surprise

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For all types of looming surprise, IC analysts—in addition to cultivating expertise, employing sound tradecraft, and developing close ties to collectors—can scrutinize anomalous events, outlier data, and incongruous information for relevant clues. Doing so can help widen the bounds of the imaginable, enabling analysts to consider a more variegated set of contingencies beyond the starkest or most familiar ones.

Heed Hunches, Anomalies, and Data Outliers. The initial clues of sudden change are often isolated, irregularly timed, and ragged, but they deserve extra attention. Hunches prompted by the notice of anomalous data or discrepant reporting can be valuable prods to reexamine prevailing analytic "party lines." Anomalous information and outlier data can be "hidden in plain sight" or be hidden in obscure places, requiring labor-intensive research.

- During the Cold War, for example, the first hints of the coming Sino-Soviet split—a major strategic discontinuity—came when Western observers detected unusually polemical articles in obscure Soviet and Chinese journals debating arcane points of communist theory.
- Such questioning requires deliberate practice, as it goes against the ingrained cognitive habit of fixating on confirmatory, rather than discomfirmatory, data.

APPLICATION

An IC Research Director in late 2011 initiated a strategic conversation within her analytic unit by asking, "What sort of event or crisis in [your area of analytic responsibility] would get you called in at 0200 on a weekend morning?" This sort of stark, open-ended question is ideal for prompting blue-sky thinking about all sorts of discontinuities and wild cards that might not be obvious from merely following the incoming traffic.

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The Importance of Anomalies

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"Discovery commences with the awareness of anomaly, i.e., with the recognition that nature has somehow violated the paradigm-induced expectations that govern normal science. It then continues with a more or less extended exploration of the area of anomaly. And it closes only when the paradigm theory has been adjusted so that the anomalous fact has become the expected. Assimilating a new sort of fact demands more than just an additive adjustment of theory, and until ... the scientist has learned to see nature in a new way—the new fact is not quite a scientific fact at all."

(b)(3)

—Science Historian Thomas Kuhn in *The Structure of Scientific Revolutions*, 1962

(b)(3)

Conduct Premortems and Predictable Surprise Reviews. These techniques are useful tools for stress testing an analytic line—particularly one that forecasts system stability. A premortem assumes that the analytic line is spectacularly wrong and that an unanticipated discontinuity has already occurred.

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- Working from these assumptions, analysts can work backward to ask what went "wrong" and to generate plausible reasons for the presumed intelligence failure.

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- Cognitive psychologist Gary Klein in an academic article from 2007 recommends premortems as an antidote to overinvestment in a "party line" group judgment. Such exercise can also sensitize analysts to early indicators that system stability is eroding.

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Anticipate "Predictable" Surprises. This approach developed by Max H. Bazerman and Michael D. Watkins in their 2004 book, *Predictable Surprises: The Disasters You Should Have Seen Coming, and How to Prevent Them,* focuses on festering problems, such as an unsustainable status quo in governance or economics. The common threads of predictable surprises are that:

- They worsen over time.
- They will most likely tip toward a crisis unless the trajectory is altered.
- They are ignored or played down by the key decisionmakers, although some observers are aware of these problems and may even warn of them.

As applied to intelligence analysis, the predictable surprise concept would help analysts assess the vulnerabilities of maladaptive systems. Such systems might include autocratic governments, obsolete multilateral institutions, dysfunctional states, or unprepared military forces. The concept could help analysts assess a system's resistance to needed changes, identify which parties might benefit from the status quo, brainstorm and prioritize its weaknesses in a crisis, and forecast the most likely and most dangerous consequences of system failure.

- Such an approach might be well suited to complex organizations that have many moving parts and engage in countless diverse activities—such as a one-party dictatorship—but that have few channels for popular input, critical feedback, and adaptation.

APPLICATION

Analysts can conduct an analytic premortem by postulating that one or more baseline judgments on vital analytic questions are fundamentally wrong and work backward to see how and why such mistakes could crop up. These mistakes could be the result of knowledge gaps, misdirected analytic focus or weighting, bogus assumptions, faulty reasoning, cognitive biases, or status quo assumptions. Alternatively, they can ask what "predictable surprises" based on unsustainable current trends might be lurking in their areas of analytic responsibility.

Conduct Regular Discontinuity Audits. A periodic canvassing of analytic teams for their assessment of the likelihoods of various types of discontinuities can help analysts begin thinking about their relative risks and signposts to monitor. A discontinuity audit sheet is an analytic survey that asks analysts to consider factors contributing to major discontinuities of all types—political, economic, social, and strategic—and to weigh the risks of such possibilities. Discontinuity audits serve numerous functions, including the following:

- They give analysts more leeway to focus on the risks of sudden, nonlinear changes in their areas of analytic responsibility.
- They provide a venue for analysts to provide and compare their best guesses on the risks of one or more discontinuities.
- They encourage analysts to consider wild cards, key uncertainties, information gaps, and unexpected developments that could derail straight line extrapolations and skew forecasts.
- They provide IC analytic managers with an aggregated view of their analytic team's perspective on the risks of discontinuities.

The Value of Hunches

> "Data are about the past. Strategic inflection points are about the future . . . [so] you have to know when to argue with data. Yet you have to be able to argue with the data when your experience and judgment suggest the emergence of a force that may be too small to show up in the analysis but has the potential to grow . . . and change the rules [of the game] . . . when dealing with emerging trends, you may very well have to go against rational extrapolation of data and rely instead on anecdotal observations and your instincts."
>
> —Former Intel CEO Andy Grove in *Only the Paranoid Survive*, 1996

APPLICATIONS

Discontinuity evaluations can be quick and informal small-group discussions among analytic teams or detailed and comprehensive canvassing of the range of views of possible discontinuities across the IC. The focal questions might be as straightforward as the following:

- How would you [the analyst] rate the relative risks of: labor/social unrest, serious civil disorder, and major human rights abuses, the fall of the government; a grave economic downturn; or the outbreak of a major conflict or large-scale terrorist attack?

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- Are those risks increasing or decreasing? Why?
- What data are you seeing—or not seeing—that worry you the most?
- What sorts of indicators might we see if one or more of these various discontinuities were/were not becoming more likely?

Resources for Analysts

The following resources and learning aids can help analysts think about discontinuities in their areas of analytic responsibility.

- **Senior analysts and managers** who have experienced discontinuities in their professional area possess insights into the dynamics of an intelligence crisis. They are also repositories of information about IC resources on surprise.
- **IC and DOD tradecraft cells** can help analysts with research design, conceptualization, and structured assessment of possible discontinuities in their professional bailiwicks. IC and DOD red teams can help analysts undertake vulnerability assessments of the institutions and organizations that they monitor.
- **The schools and centers at CIA University** offer courses and online resources on various aspects of surprise and warning in diverse fields. **CIA's Sherman Kent School** tailors its courses to the needs of IC analysts on these topics.
- **CIA's Center for the Study of Intelligence** offers a rich repository of relevant oral histories, lessons learned, and publications, including through its quarterly journal, *Studies in Intelligence*. **The history staffs at other components of the IC** can also assist analysts with materials from historical case studies.
- **DIA's National Intelligence University** offers courses and publications on strategic surprise. The **John T. Hughes Library** has a large repository of historical works on strategic surprise and on academic literature on the subject.
- **War colleges** offer curricula and bibliographic resources that can help attendees expand their understanding of strategic surprise.
- **Academic and historical literature** on intelligence surprise and warning is vast (see appendix B for more information).
- **IC online resources**—including Intellipedia and blogs—offer articles and training aids on diverse aspects of surprise, warning, and discontinuities (see appendix C for more information).

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Appendixes

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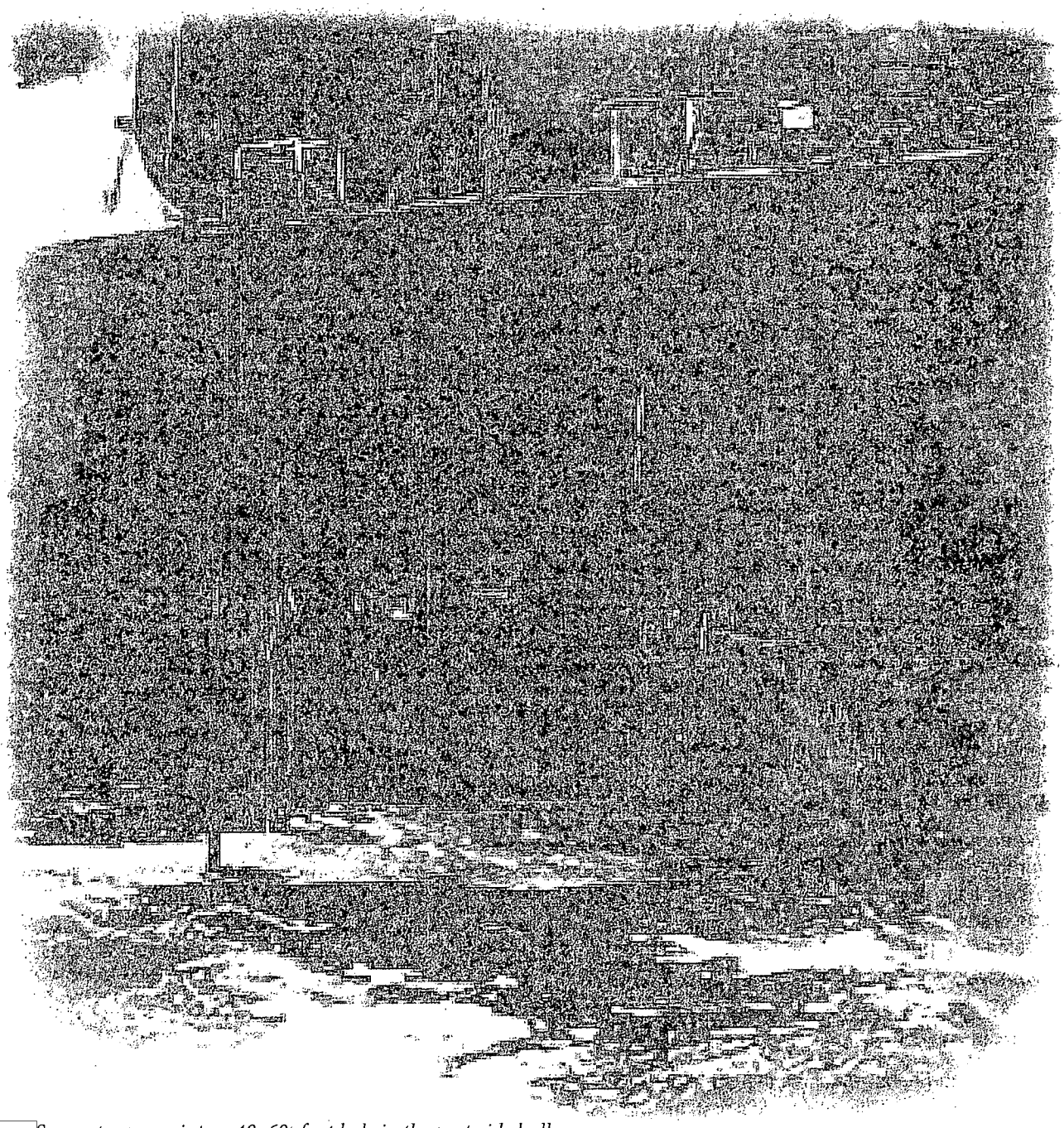

Sea water pours into a 40x60–foot hole in the port-side hull of the US Navy destroyer, USS Cole, in the Yemeni port of Aden shortly after the 12 October 2000 al-Qa'ida attack.

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Appendix A (b)(3)

Alternative Ways of Categorizing Surprise

There are other ways of classifying surprise, besides focusing on its essential nature, which is the method suggested in this IC training aid. Other classifications focus on the following: (b)(3)

Domain. Surprise can be categorized by its primary or initial field of operation. Most cases of strategic surprise fall into the realm of military surprise: large-scale surprise attacks that initiate a war, such as Nazi Germany's invasion of the Soviet Union in 1941 or the Israeli air strikes at the start of the Six-Day War with Arab states in 1967. (b)(3)

- Others are political—for example, the fall of the Shah of Iran in 1979, of Ben Ali in Tunisia, and of Hosni Mubarak in Egypt in early 2011. (b)(3)
- In diplomacy, surprise is rarer, but it does occur, as when Egyptian President Anwar Sadat ousted Soviet advisers in 1972 or when the Hitler-Stalin Pact was negotiated in August 1939 after weeks of secret diplomacy—followed one week later by German invasion of Poland, starting World War II. (b)(3)
- Technological surprise occurs when another actor develops a capability that others did not think possible at all or well before rivals judged possible, such as the Soviet development of the atomic bomb in 1949, at least five years before CIA analysts judged it to be likely. (b)(3)
- Cases of economic surprise include the imposition of the Arab/OPEC oil embargo on the United States and the Netherlands in 1973-74 and the global financial crisis. (b)(3)

Perspective of the Observer. Surprise can be lumped into two groups: something, such as a surprise attack, aimed at "us" and that happens to "us"; or something that happens elsewhere, such as the fall of a pro-Western government in a popular revolt, that is not aimed at us but that affects us substantially. (b)(3)

- Although surprise is typically regarded as a "bad" thing for an observer—because he was taken unawares by a harmful event—some surprises are positive from the optic of an observer, such as the collapse of communism in Eastern Europe and the Soviet Union in 1989-91 was for NATO countries. (b)(3)

Nationality of the Victim State. Surprise—particularly strategic surprise—can also be further categorized by country—that is, which country was the victim of the surprise. Virtually all the major powers—the United States, France, Germany, Great Britain, Japan, and the Soviet Union—and many smaller powers, including Israel, were victims of strategic surprise in the 20th century. (b)(3)

Significance of the Surprise. Surprise is a constantly recurring event in human affairs. It can be ranked or categorized by its significance or magnitude. In many cases, it occurs at a low or, at least, manageable scale. (b)(3)

- Some surprises—such as the US technological surprise over the USSR's launch of the Sputnik satellite, the world's first, in 1957—are less significant than they seemed at the time. (b)(3)

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- However, in others cases—such as the attack on Pearl Harbor, the Cuban Missile Crisis, the Arab-Israeli war of 1973, or the attacks of 11 September 2001—the surprise has a colossal, lasting impact on the key actors and on broader regional and global affairs.
- Some, such as the German invasion of the Netherlands and France in 1940, led to the utter defeat and overthrow of the sitting government. (b)(3)

Selected Definitions of Surprise—Excerpts From the Oxford English Dictionary (b)(3)

Surprise: 1. (Military) The act of assailing or attacking unexpectedly or without warning . . . sudden attack or capture of a fort, a body of troops, etc. that is unprepared . . . (b)(3)

2. B. to take by surprise. . . . to take unawares . . . (b)(3)

4. A. Alarm, terror, or perplexity, caused by sudden attack, calamity, or the like . . . (b)(3)

From French: *surprendre,* surprise, *sur-*, over + *prendre,* to take or seize. (b)(3)

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Appendix B

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Academic Resources on Surprise

Sudden Hostile Action

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***Surprise Attack: Lessons for Defense Planning,* by Richard K. Betts, (The Brookings Institution Press, 1982).** This work provides a case studies and comparative approach to the problem of anticipating and defending against strategic surprise. Betts's incisive examination of why every major power of the 20th century was a victim of at least one surprise attack leads the author—one of the deans of intelligence studies—to conclude that some degree of surprise is "inevitable." Betts discusses in detail the political, organizational, communication, and cognitive barriers that hinder reactions to looming strategic threats. Although tailored to Cold War–era strategic problems, the study remains valuable today. Many of the author's scholarly articles on various aspects of intelligence since publication of *Surprise Attack* in 1982 also shed light on the problems of surprise and analytic uncertainty.

(b)(3)

***Anticipating Surprise: Analysis for Strategic Warning,* by Cynthia M. Grabo (University Press of America, 2004).** Written by a veteran DOD intelligence officer, this work—based on her larger Cold War–era study of the topic—provides a rigorous and sophisticated overview of strategic warning. The author stresses the importance of an integrated analytic approach to assessing warning indicators and the need for an ongoing dialogue with policymakers about what strategic warning can provide (warning of an adversary's readiness to attack) and what it cannot (precise advanced notification of timing). The author's focus is drawn mostly from Cold War–era case studies of state-on-state surprise attacks, with virtually no focus on nonstate actors.

(b)(3)

***Paradoxes of Strategic Intelligence: Essays in Honor of Michael I. Handel,* Richard K. Betts and Thomas G. Mahnken, editors (Routledge, 2003).** This work offers a rich trove of chapter articles on various aspects of strategic surprise by scholars of strategic surprise. The first one, by the late Israeli intelligence scholar, Michael I. Handel, notes the paradox of surprise and risk—the more dangerous the gamble in initiating an attack against a superior foe, the greater the actual odds of achieving surprise. James J. Wirtz's chapter, "A Theory of Surprise," examines the structural factors that make achieving surprise attractive—particularly for a weaker adversary, whose initial tactical successes often fail to be converted into lasting strategic victories.

(b)(3)

***Surprise Attack: The Victim's Perspective,* by Ephraim Kam (Harvard University Press, 1988).** This book by an Israeli scholar of intelligence delves into the numerous political, organizational, cognitive, and psychological impediments to anticipating surprise. Based on the author's personal experience as an Israeli Ministry of Defense analyst and on 11 historical case studies, Kam provides an analyst's-eye view of intelligence failures involving what he identifies as the hardest task facing analysts—the anticipation and prediction of a coming war. His book is particularly useful for its coverage of other countries' experiences as victims of strategic surprise.

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(b)(3) ***Crazy States: A Counter-Conventional Strategic Problem*, by Yehezkel Dror (Krauss Reprint, 1980).** This idiosyncratic work by an Israeli political science professor provides a forceful rebuttal to rational unitary actor assumptions about the strategic behavior of states. Dror defines "crazy" actors as zealous leaders motivated by extremist ideologies or religious fundamentalism to pursue radical goals by any means necessary. Dror examines the implications of his concepts for decisionmakers and analysts involved in strategic forecasting. Although dated and occasionally opaque, the book is a useful primer for leadership analysts and others grappling with the problem of how to anticipate the moves of aggressive, "high commitment" leaders.

(b)(3) ***Strange Victory: Hitler's Conquest of France*, by Ernest May (Hill and Wang, 2001).** May's book is an international study of European diplomatic, political, military and intelligence history, leading to Germany's invasion and defeat of France in May and June of 1940. An impressively researched case study, the book provides a detailed look at France's planning and intelligence failures, the effects of which were all magnified by Germany's corresponding successes and by luck that broke sharply in favor of the more prepared German invaders. Chapter 24, "Intelligence Failure," can be read as a standalone analysis of the role of strategic surprise and the precise circumstances and bad luck that fueled France's intelligence and strategy failures. His concluding chapter, "Why? And What Can Be Learned," builds on his work on "thinking in time" and makes a plea for analytic caution and prudent hedging of high-stakes assessments.

(b)(3) ***Pearl Harbor: Warning and Decision*, by Roberta Wohlstetter (Stanford University Press, 1962).** A classic in intelligence scholarly literature, this book was a pioneering examination of the shortcomings in intelligence and military policy that exposed the United States to the devastating surprise attack on Pearl Harbor. The work introduced key concepts—signals (relevant clues) versus noise (misleading or irrelevant data) and the "poverty of imagination"—that remain staples today of academic studies and intelligence failure postmortems. The forward, by political scientist and later Nobel Laureate in Economics Thomas C. Schelling, is itself a brilliant summary of the complex chain of events and organizational gaps that heighten vulnerability to surprise attack. *At Dawn We Slept: The Untold Story of Pearl Harbor* by the late Gordon W. Prange remains the best general history of the Pearl Harbor attack.

(b)(3) ***The Tet Offensive: Intelligence Failure in War*, by James J. Wirtz (Cornell University Press, 1991).** This in-depth study of US intelligence failures before the communist Tet holiday offensive in early 1968 examines the pre-Tet mind-sets, assumptions, and policy pressures that made the intrinsically difficult task of anticipating the communists' next move even harder. The author's introductory discussion provides a pithy systems-approach overview to the problems of intelligence warning. His discussion in chapter three of the various historical analogies (the Battle of the Bulge in 1944, Dien Bien Phu in 1954, and Chinese intervention in Korea in late 1950) that shaped and distorted US thinking before the offensive serves as a warning to analysts and decisionmakers today about the dangers of misapplying historical analogies to current conditions. Wirtz's many articles on intelligence affairs since publication of this work are also worthy of examination.

(b)(3) ***The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States*, official edition (2004).** The report includes a detailed account of the system-wide vulnerabilities in US Homeland security preceding the attacks of 11 September 2011. The scope is wide-ranging but includes, in chapter 11, a discussion of strategic foresight. Borrowing a concept from Roberta Wohlstetter's account of Pearl Harbor, the report calls for "a way of routinizing, even bureaucratizing, the exercise of imagination" (p. 344). It makes the case for red teaming and for rigorous generation, updating, and monitoring of diagnostic indicators of looming attacks (p. 347).

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System Shock

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(b)(3) ***Manias, Panics, and Crashes: A History of Financial Crises, fifth edition*, by Charles P. Kindleberger and Robert Aliber (John Wiley & Sons, Inc., 2005).** A witty, penetrating, nonquantitative examination of patterns of financial crises and crashes. The authors employ both theory and history to make the point that "details proliferate; structure abides" and to assert the relevance of their model of bubbles, manias, and panics to today's world. It is useful to economic analysts trying to come to grips with financial meltdowns.

(b)(3) ***The Black Swan: The Impact of the Highly Improbable*, by Nassim Nicholas Taleb (Random House, 2007).** This feisty and unconventional tome by a philosopher and former financial trader has been widely praised—especially since the onset of the global financial crisis in 2008—for its prescience and insight. Taleb explains and elaborates on his concept of "black swans"—rare events that are nearly impossible to predict that have extreme effects on societies and states. He cites as examples World War I, the rise of Adolf Hitler, the collapse of the Soviet Union, the Great Depression, and the rise of the Internet. The author condemns false precision and bogus forecasting and calls for prudence and resilience in response to the inevitable occurrence of future "black swans."

(b)(3) ***Normal Accidents: Living With High-Risk Technologies*, by Charles Perrow (Princeton University Press, 1999).** This book—which helped launch the field of academic accident research—is a provocative study of the risks of organizational and technological complexity. The author, a professor of sociology at Yale University, examines complex "tightly coupled" industrial and technological systems at risk of catastrophic failure. He points to the unintended consequences of building more top-down, overengineered safeguards into processes, which pile on more complexity. His research and concepts can easily be applied to complex social and political systems with many actors.

(b)(3) ***Critical Transitions in Nature and Society*, by Marten Scheffer (Princeton University Press, 2009).** The author, a Dutch professor of environmental science, provides a lucid, nontechnical guide to some key concepts in dynamical systems theory. Part I of the book, "Theory of Critical Systems," is particularly useful in walking scientists and laymen alike through the properties of complex systems, including concepts such as alternative equilibriums, resilience, adaptive capacity, and critical transitions—which the author defines as "sharp shifts in systems driven by runaway change toward a contrasting alternative state once a threshold is exceeded." Although focused on examples in the natural world, Part III of the book examines the implications of critical systems for political and social change.

(b)(3) ***Collapse: How Societies Choose to Fail or Succeed*, by Jared Diamond (Penguin Books, 2005).** This book by the author of *Guns, Germs, and Steel* examines catastrophic breakdowns in political leadership and collective action. Although focused on environmental affairs, the analysis of poor group decisionmaking can be extrapolated to governments and militaries as well. The author's discussion in chapter 14, "Why Do Some Societies Make Disastrous Decisions," includes a provocative discussion of "rational bad behavior"—inertia, passivity, short-termism, and historical amnesia—that is useful to leadership analysts trying to get past mirror-imaging and rational actor assumptions.

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***Only the Paranoid Survive: How to Exploit the Crisis Points That Challenge Every Company and Career*, by Andrew S. Grove (Harper Collins Publishers, 1996).** This book by the former president and CEO of Intel Corporation is a street-smart guide to anticipating "strategic inflection points" in the operating environment. Although based on Grove's own legendary leadership of Intel, his discussion of strategic inflection points and the need for vigilance are relevant to analysts and IC managers as well. The "paranoia" in the title refers to acute sensitivity to data anomalies and outlier signals of looming "10X" exponential change—and includes concepts highly relevant to the domain of analysis.

(b)(3)

***Predictable Surprises: The Disasters You Should Have Seen Coming, and How to Prevent Them*, by Max H. Bazerman and Michael D. Watkins (Harvard Business School Press, 2004).** This book provides a model for recognizing emerging problems (threats, dangers), prioritizing them, planning and mobilizing an effective response for dealing with them, and taking action. Some of their proposals—ensuring proper system measurement of the right performance variables, acute sensitivity to changing environmental variables, scenario planning, and a disciplined learning process to capture lessons learned—are also helpful to analysts.

Tectonic Transformation

(b)(3)

(b)(3)

***Thinking in Time: The Uses of History for Decision Makers*, by Richard E. Neustadt and Ernest R. May (The Free Press, 1986).** Justly acclaimed by analysts, scholars, as well as decisionmakers, this work by two experienced Harvard University scholars is based on their teaching of "the uses of history" based on a case studies approach to midcareer military and civilian executives. Of particular use to analysts are the chapters on the Bay of Pigs fiasco, the Cuban Missile Crisis in 1962, US strategy and policy in the Korean and Vietnam wars, arms control, the rescue in 1975 by US forces of the crew of the Mayaguez, and Soviet economic performance and assessment. Their discussion of the pathologies of poor crisis management—bias toward hasty action, shoddy thinking, bogus analogies, failure to revisit assumptions, ignorance or misuse of history, and failure to game out various scenario paths based on one's own possible actions—remain relevant for any level of analysis.

(b)(3)

***Essence of Decision: Explaining the Cuban Missile Crisis*, second edition, by Graham Allison and Philip Zelikow (Longman, 1999).** This expanded edition of Allison's classic examination of decisionmaking in the Kennedy Administration during the Cuban Missile Crisis has been updated with newly declassified evidence from US and Soviet/Russian sources. The discussion of the utility and limits of the rational actor paradigm in analysis and forecasting remains a classic. The authors build their model of government decision making by adding models on organizational dynamics that stress routinization and reliance on standard operating procedures and on political forces that shape policy decisions via political bargaining and gamesmanship.

(b)(3)

***System Effects: Complexity in Political and Social Life*, by Robert Jervis (Princeton University Press, 1997).** Jervis, a leading scholar on pitfalls in intelligence analysis, offers a nontechnical discussion of complexity theory, with an emphasis on its applications to politics, diplomacy, and security. Based on his own decades of studies, an extensive review of the scholarly literature, and numerous case studies, Jervis explains the concepts of complexity, nonlinearity, feedback loops, randomness, and the role of interactions.

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***Complex Adaptive Systems: An Introduction to Computational Models of Social Life*, by John H. Miller and Scott E. Page (Princeton University Press, 2007).** This is a nontechnical primer on computational modeling of social and political life. The book is a useful blend of cognitive science, behavioral science, and game theory, with helpful advice for would-be modelers. The discussion of agent-based modeling is particularly useful. (b)(3)

***The Art of the Long View: Planning for the Future in an Uncertain World,* by Peter Schwartz (Doubleday, 1996).** This work by a leading futurist explains the roles, purposes, value, and techniques of scenario development and examination. The author provides useful examples of prior scenario exercises, explains how to develop effective scenarios that challenge the "official future," and stresses the importance of a "strategic conversation" about the various scenarios to engage decisionmakers and provide strategic foresight. The appendixes, "Users Guide: How to Hold a Strategic Conversation" and "Steps to Developing Scenarios," are particularly useful to practitioners. (b)(3)

Barriers to Early Perception of Looming Discontinuities (b)(3)

Most of the works listed above examine at least some of the barriers to timely analytic discernment of distant or looming discontinuities. The books listed below examine the issue of barriers directly, but the list is not exclusive. (b)(3)

***The Psychology of Intelligence Analysis*, by Richards J. Heuer, Jr. (Center for the Study of Intelligence, CIA, Washington, DC, 1999).** The author drew on his nearly five decades of experience in intelligence affairs and extensive reading on cognition to publish what has become the standard reference work on the barriers to sound intelligence analysis. Written in lucid, nontechnical prose, Heuer addresses cognition and cognitive limits, mind-sets and biases, and methods for overcoming them. Part II of the book, "Tools for Thinking," is particularly helpful for intelligence analysts. The introduction written by Jack Davis, who was pioneer of analytic reform in his own right, provides a useful summary of Heuer's main points and recommendations. (b)(3)

***Analytic Culture in the US Intelligence Community*, by Rob Johnson (Center for the Study of Intelligence, CIA, Washington, DC, 2005).** This perceptive ethnographic study is based on extensive research—including interviews with 345 intelligence professionals—that gives it a rare degree of insight into the problems confronting line analysts and analytic managers. The book exudes a respect and sympathy for intelligence professionals in the trenches that in no way detracts from its objectivity or its criticisms of the current IC analytic culture. Johnson's candid self-criticism of the intellectual mistakes that he made as a young scholar trying to forecast the outcome of the unrest in Tiananmen Square in China in 1989 (chapter six: "Combating Ethnocentrism...") should be required reading for all analysts. This publication is worthwhile for anyone who wants to understand the world of IC analysts from the inside or to improve the IC's overall analytic performance. (b)(3)

***Expert Political Judgment: How Good Is It? How Can We Know It?*, by Philip E. Tetlock (Princeton University Press, 2006).** The author's unsparing examination of the hazards of political forecasting and of the cognitive and psychological factors that cause forecasters to fail—often repeatedly—is a humbling experience for anyone trying to forecast real-world change. The usefulness of this book is magnified by the fact that some of the author's case studies, in which he recorded and evaluated participants' predictions over time, involve what turned out to be real-world discontinuities, including the fall of the Soviet Union. The author—a professor of leadership—makes a strong case for intellectual humility, prudence, and openmindedness, as well as for accountability and self-assessment of forecasting failures. (b)(3)

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(b)(3) ***Thinking and Writing: Cognitive Science and Intelligence Analysis,* By Robert S. Sinclair (Center for the Study of Intelligence, CIA, Washington, DC; February 2010; originally published in January 1984).** This republication of a remarkably prescient 1984 monograph examines many of the topics—cognition, creativity, conceptualization, and organizational cultures—that have become commonplace in the decades since it appeared nearly three decades ago.

(b)(3) ***The Structure of Scientific Revolutions, second edition,* by Thomas S. Kuhn (University of Chicago Press, 1969).** Kuhn's landmark work in the history of science stressed the importance of paradigms (a coherent and consistent body of scientific theories, laws, and applications) and of anomalies (data that appear to violate paradigm-induced expectations that govern the prevailing intellectual orthodoxy) in evaluating, critiquing, and challenging our understanding of the world. Written in straightforward nonscientific prose, the author examines how theories first become entrenched as the reigning status quo paradigm and how over time new data and observations that are inconsistent with old models lead to revolutionary scientific breakthroughs (often at considerable cost to reputations and friendships within the scientific establishment). Chapter 6 on "Anomaly and the Emergence of Scientific Discoveries" is particularly useful to intelligence analysts.

(b)(3) General Use

(b)(3) ***Challenges in Intelligence Analysis: Lessons from 1300 BCE to the Present,* by Timothy R. Walton (Cambridge University Press, 2010).** This work by a seasoned intelligence scholar and former analyst presents a masterly guide to the problems and methods of intelligence analysis. It introduces basic concepts, terms, and analytic methods; examines more than 40 historical case studies; and provides follow-up questions and recommended reading for further study. The variety of case studies—including on episodes of surprise involving nonstate actors—makes this work useful to a particularly broad range of practitioners, including law enforcement and public health professionals. The author served in the US Navy and in the IC as an intelligence analyst and instructor.

(b)(3) ***Improving Intelligence Analysis: Bridging the Gap Between Scholarship and Practice,* by Stephen Marrin (Routledge, 2011).** This constructive work by an intelligence scholar who previously served as a CIA analyst begins with a perceptive discussion of the gap between intelligence practitioners and intelligence scholars and goes on to discuss ways to narrow or close that gap. The author tackles the problem of improving intelligence analysis by examining the analytic discipline as an art, science, profession, and practice. It is comprehensive, well researched, and chock full of practical insights and suggestions.

(b)(3) ***A Primer on Modeling and Simulation,* published by the National Training and Systems Association (NTSA, 2011).** This readable beginner's guide into modeling and simulation (M&S) provides a working definition of modeling and simulations, briefly reviews the history of M&S, discusses applications, and evaluates the utility of M&S. Useful so far is it goes, it does not provide a user's guide about how to conduct—or even begin to plan—a simulation or develop a model

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Appendix C

(b)(3)

Unclassified IC Training Aids

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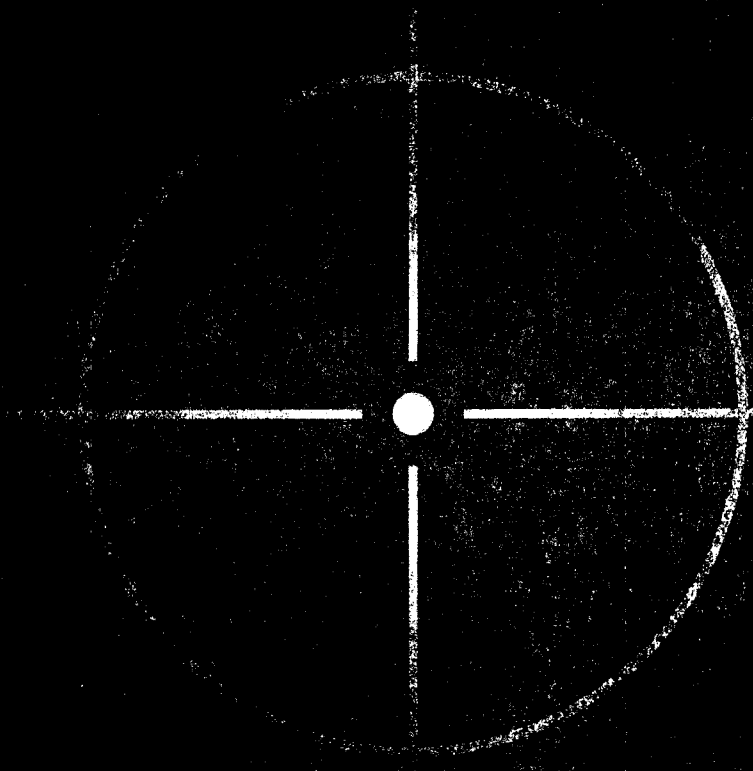

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