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God Gave Physics the Easy Problems: Adapting Social Science to an Unpredictable World

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For conceptual and empirical reasons the quest for predictive theory rests on a mistaken analogy between physical and social phenomena. Evolutionary biology is a more productive analogy for social science. We explore the value of this analogy in its 'hard' and 'soft' versions, and examine the implications of both for theory and research in International Relations. We develop the case for forward 'tracking' of International Relations on the basis of local and general knowledge as a constructive response to the problems we identify in backward-looking attempts to build deductive, nomothetic theory.

KEY WORDS ♦ analogies to science ♦ ethnic conflict ♦ forecasting ♦ privatization of security ♦ proliferation ♦ scenarios

Many of the scholars responsible for the behavioral revolution in social science were European refugees who sought to use the tools of social science to analyze the causes of war, prejudice, civil unrest and poverty. Their commitment to social science flowed from an even deeper commitment — to use disciplined methodologies to generate knowledge that would help prevent the horrors of war and fascism and improve the world around them. They and their American collaborators were not interested in theory for its own sake, but principally for the capacity it might provide to analyze and address world problems.

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This vision has been largely lost. From the vantage point of the 21st century, it is sadly apparent that the founding fathers of the behavioral revolution failed to transmit as clearly the value commitments that motivated their 'scientific' study of international relations. For many of their students and grand-students, the 'scientific means' has become more an end in itself, and the 'science' of the social, a *jeu d'ésprit*, like chess. In the worst instances, researchers choose problems to investigate because the problems are thought to be tractable, not because they are important. They evaluate solutions in terms of the elegance of the logic rather than actual evidence. Meanwhile, on the other extreme, those who do study policy problems frequently do so in isolation from those working seriously with theory. Both communities are thus impoverished. The founders of the scientific study of international relations would bemoan the separation of theory from evidence and of logic from data.[1] Most of all, the founders would reject the separation of theory from policy and its relative failure to address practical problems of the political world.

A deep irony is embedded in the history of the scientific study of international relations. Recent generations of scholars separated policy from theory to gain an intellectual distance from decision-making, in the belief that this would enhance the 'scientific' quality of their work. But five decades of well-funded efforts to develop theories of international relations have produced precious little in the way of useful, high confidence results. Theories abound, but few meet the most relaxed 'scientific' tests of validity. Even the most robust generalizations or laws we can state — war is more likely between neighboring states, weaker states are less likely to attack stronger states — are close to trivial, have important exceptions, and for the most part stand outside any consistent body of theory.

A generation ago, we might have excused our performance on the grounds that we were a young science still in the process of defining problems, developing analytical tools and collecting data. This excuse is neither credible nor sufficient; there is no reason to suppose that another 50 years of well-funded research would result in anything resembling a valid theory in the Popperian sense. We suggest that the nature, goals and criteria for judging social science theory should be rethought, if theory is to be more helpful in understanding the real world.

We begin by justifying our pessimism, both conceptually and empirically, and argue that the quest for *predictive* theory rests on a mistaken analogy between physical and social phenomena. Evolutionary biology is a more productive analogy for social science. We explore the value of this analogy in its 'hard' and 'soft' versions, and examine the implications of both for theory and research in international relations.[2] We develop the case for forward 'tracking' of international relations on the basis of local and general

knowledge as an alternative to backward-looking attempts to build deductive, nomothetic theory. We then apply this strategy to some emerging trends in international relations.

This article is not a nihilistic diatribe against 'modern' conceptions of social science. Rather, it is a plea for constructive humility in the current context of attraction to deductive logic, falsifiable hypothesis and large-*n* statistical 'tests' of narrow propositions. We propose a practical alternative for social scientists to pursue in addition, and in a complementary fashion, to 'scientific' theory-testing.

Newtonian Physics: A Misleading Model

Physical and chemical laws make two kinds of predictions. Some phenomena — the trajectories of individual planets — can be predicted with a reasonable degree of certainty. Only a few variables need to be taken into account and they can be measured with precision. Other mechanical problems, like the break of balls on a pool table, while subject to deterministic laws, are inherently unpredictable because of their complexity. Small differences in the lay of the table, the nap of the felt, the curvature of each ball and where they make contact, amplify the variance of each collision and lead to what appears as a near random distribution of balls.

Most predictions in science are probabilistic, like the freezing point of liquids, the expansion rate of gases and all chemical reactions. Point predictions appear possible only because of the large numbers of units involved in interactions. In the case of nuclear decay or the expansion of gases, we are talking about *trillions* of atoms and molecules.

In international relations, even more than in other domains of social science, it is often impossible to assign metrics to what we think are relevant variables (Coleman, 1964: especially Chapter 2). The concepts of polarity, relative power and the balance of power are among the most widely used independent variables, but there are no commonly accepted definitions or measures for them. Yet without consensus on definition and measurement, almost every statement or hypothesis will have too much wiggle room to be 'tested' decisively against evidence. What we take to be dependent variables fare little better. Unresolved controversies rage over the definition and evaluation of deterrence outcomes, and about the criteria for democratic governance and their application to specific countries at different points in their history. Differences in coding for even a few cases have significant implications for tests of theories of deterrence or of the democratic peace (Lebow and Stein, 1990; Chan, 1997).

The lack of consensus about terms and their measurement is not merely the result of intellectual anarchy or sloppiness — although the latter cannot

entirely be dismissed. Fundamentally, it has more to do with the arbitrary nature of the concepts themselves. Key terms in physics, like mass, temperature and velocity, refer to aspects of the physical universe that we cannot directly observe. However, they are embedded in theories with deductive implications that have been verified through empirical research. Propositions containing these terms are legitimate assertions about reality because their truth-value can be assessed. Social science theories are for the most part built on 'idealizations', that is, on concepts that cannot be anchored to observable phenomena through rules of correspondence. Most of these terms (e.g. rational actor, balance of power) are not descriptions of reality but implicit 'theories' about actors and contexts that do not exist (Hempel, 1952; Rudner, 1966; Gunnell, 1975; Moe, 1979; Searle, 1995: 68–72). The inevitable differences in interpretation of these concepts lead to different predictions in some contexts, and these outcomes may eventually produce widely varying futures (Taylor, 1985: 55).

If problems of definition, measurement and coding could be resolved, we would still find it difficult, if not impossible, to construct large enough samples of comparable cases to permit statistical analysis. It is now almost generally accepted that in the analysis of the causes of wars, the variation across time and the complexity of the interaction among putative causes make the likelihood of a general theory extraordinarily low. Multivariate theories run into the problem of negative degrees of freedom, yet international relations rarely generates data sets in the high double digits. Where larger samples do exist, they often group together cases that differ from one another in theoretically important ways.[3] Complexity in the form of multiple causation and equifinality can also make simple statistical comparisons misleading. But it is hard to elaborate more sophisticated statistical tests until one has a deeper baseline understanding of the nature of the phenomenon under investigation, as well as the categories and variables that make up candidate causes (Geddes, 1990: 131–50; Lustick, 1996: 505–18; Jervis, 1997).

Wars — to continue with the same example — are similar to chemical and nuclear reactions in that they have underlying and immediate causes. Even when all the underlying conditions are present, these processes generally require a catalyst to begin. Chain reactions are triggered by the decay of atomic nuclei. Some of the neutrons they emit strike other nuclei prompting them to fission and emit more neutrons, which strike still more nuclei. Physicists can calculate how many kilograms of Uranium 235 or Plutonium at given pressures are necessary to produce a chain reaction. They can take it for granted that if a 'critical mass' is achieved, a chain reaction will follow. This is because trillions of atoms are present, and at any given moment enough of them will decay to provide the neutrons needed to start the

reaction. In a large enough sample, catalysts will be present in a statistical sense.

Wars involve relatively few actors. Unlike the weak force responsible for nuclear decay, their catalysts are probably not inherent properties of the units. Catalysts may or may not be present, and their potentially random distribution relative to underlying causes makes it difficult to predict when or if an appropriate catalyst will occur. If in the course of time underlying conditions change, reducing basic incentives for one or more parties to use force, catalysts that would have triggered war will no longer do so. This uncertain and evolving relationship between underlying and immediate causes makes point prediction extraordinarily difficult. It also makes more general statements about the causation of war problematic, since we have no way of knowing what wars would have occurred in the presence of appropriate catalysts. It is probably impossible to define the universe of would-be wars or to construct a representative sample of them.

Statistical inference requires knowledge about the state of independence of cases, but in a practical sense that knowledge is often impossible to obtain in the analysis of international relations. Molecules do not learn from experience. People do, or think they do. Relationships among cases exist in the minds of decision-makers, which makes it very hard to access that information reliably and for more than just a very small number of cases. We know that expectations and behavior are influenced by experience, one's own and others. The deterrence strategies pursued by the United States throughout much of the Cold War were one kind of response to the failure of appeasement to prevent World War II. Appeasement was at least in part a reaction to the belief of British leaders that the deterrent policies pursued by the continental powers earlier in the century had helped to provoke World War I. Neither appeasement nor deterrence can be explained without understanding the context in which they were formulated; that context is ultimately a set of mental constructs. We have descriptive terms like 'chain reaction' or 'contagion effect' to describe these patterns, and hazard analysis among other techniques in statistics to measure their strength. But neither explains how and why these patterns emerge and persist.

The broader point is that the relationship between human beings and their environment is not nearly so reactive as with inanimate objects. Social relations are not clock-like because the values and behavioral repertories of actors are not fixed; people have memories, learn from experience and undergo shifts in the vocabulary they use to construct reality. Law-like relationships — even if they existed — could not explain the most interesting social outcomes, since these are precisely the outcomes about which actors have the most incentive to learn and adapt their behavior. *Any* regularities would be 'soft'; they would be the outcome of processes that are embedded

in history and have a short half-life. They would decay quickly because of the memories, creative searching and learning by political leaders. Ironically, the 'findings' of social science contribute to this decay (Weber, 1969; Almond and Genco, 1977: 496–522; Gunnell, 1982: Ch. 2; Ball, 1987: Ch. 4; Kratochwil, 1989; Rorty, 1989; Hollis, 1994: Ch. 9).

Beyond these conceptual and empirical difficulties lies a familiar but fundamental difference of purpose. Boyle's Law, half-lives, or any other scientific principle based on probability, says nothing about the behavior of single units such as molecules. For many theoretical and practical purposes this is adequate. But social science ultimately aspires — or should aspire — to provide insight into practical world problems that are generally part of a small or very small *n*. In international relations, the dynamics and outcomes of single cases are often much more important than any statistical regularities.

Overcoming Physics Envy

The conception of causality on which deductive-nomological models are based, in classical physics as well as social science, requires empirical invariance under specified boundary conditions. The standard form of such a statement is this — given A, B and C, if X then (not) Y.[4] This kind of bounded invariance can be found in closed systems. Open systems can be influenced by external stimuli, and their structure and causal mechanisms evolve as a result. Rules that describe the functioning of an open system at time T do not necessarily do so at T + 1 or T + 2. The boundary conditions may have changed, rendering the statement irrelevant. Another axiomatic condition may have been added, and the outcome subject to multiple conjunctural causation. There is no way to know this *a priori* from the causal statement itself. Nor will complete knowledge (if it were possible) about the system at time T necessarily allow us to project its future course of development.

In a practical sense, all social systems (and many physical and biological systems) are open. Empirical invariance does not exist in such systems, and seemingly probabilistic invariances may be causally unrelated (Harré and Secord, 1973; Bhaskar, 1979; Collier, 1994; Patomäki, 1996; Jervis, 1997). As physicists readily admit, prediction in open systems, especially non-linear ones, is difficult, and often impossible.

The risk in saying that social scientists can 'predict' the value of variables in past history is that the value of these variables is already known to us, and thus we are not really making predictions. Rather, we are trying to convince each other of the logic that connects a statement of theory to an expectation about the value of a variable that derives from that theory. As long as we can

establish the parameters within which the theoretical statement is valid, which is a prerequisite of generating expectations in any case, this 'theory-testing' or 'evaluating' activity is not different in a logical sense when done in past or future time.[5]

Consider how this plays out in evolutionary biology, the quintessential open system. Evolution is the result of biological change and natural selection. The former is a function of random genetic mutation and mating. The latter depends on the nature and variety of ecological 'niches' and the competition for them. These are in turn shaped by such factors as continental drift, the varying output of the sun, changes in the earth's orbit, and local conditions difficult to specify. Biologists recognize that all the primary causes of evolution are random, or if not, interact in complex, non-linear ways, and make prediction impossible. Certain kinds of outcomes can be 'ruled out' in a probabilistic sense, but almost never absolutely. Biologists have attempted to document the course of evolution and explain the ways in which natural selection works. Historical and theoretical work has resulted in a robust theory of evolution that permits scientific reconstruction of the past in the context of a logic that explains why things turned out the way they did.

One of the big controversies within this research community is about the contingency of that past. Stephen Jay Gould (1989) makes the case for the determining role of accident in evolution. He insists that if you could rewind the tape of life and run the program over again you would end up each time with a radically different set of organisms. Some of his colleagues find his claim extreme. Ever since Darwin it has been recognized that evolution produces morphological similarity because there is something like a 'best' set of physical characteristics and strategy for grappling with the challenges of life. Diverse species have converged independently on body plans and lifestyles suited to avoiding predators and exploiting food resources.[6] What is at stake in this controversy is how close the system has come to optimality; and the extent to which factors outside the system (Gould, 1989) or the system itself (Morris, 1998) are most important in shaping the course of evolution. Both sides acknowledge that the primary causes of evolution are independent of and outside any theory of evolution.

The study of evolution has been approached from scientific and heuristic perspectives. The scientific approach should be of particular interest to political scientists because it eschews prediction in favor of explanation. Working on the assumption that the course of evolution is determined by chance and context, Charles Darwin and his successors developed a theory of process to understand the past. That theory and its extensions fully meet the accepted criteria of scientific theories; they consist of a set of linked propositions with well-specified terms and domain, and are thus empirically

falsifiable. Darwinian theory, widely regarded as one of the seminal scientific advances of the modern era, challenges those political scientists who assert that prediction is the principal, or even only, goal and test of a scientific theory.

The heuristic approach to evolution consists of narratives intended to influence our thinking about ourselves and our environment. These stories and the homilies associated with them have been extremely influential. What has sometimes been called the 'Darwinian revolution', recast human conceptions of species 'uniqueness', its relationship to other life forms, and hastened the trend toward secularization by providing an eminently plausible substitute for a deity-centered account of creation. More recent work on mitochondrial DNA that suggests that Africa was the birthplace of *Homo sapiens sapiens*, and that 'Lucy' was our common ancestor, also have profound political and social implications that neither scientists nor journalists have been shy to draw. These examples stand in sharp contrast to the 19th century use of evolution to justify war and imperialism and prop up Western claims of racial superiority. Gould (1996) has recently shown how many textbook treatments of evolution are still 'species centric', and contain illustrations that show humanity as the apex of evolutionary development.

There is a nice correspondence between the heuristic forms of evolutionary biology and international relations. Narratives of international relations also encapsulate so-called lessons of the past — the more recent past, to be sure — to influence thinking about the present and future. Like homilies about evolution, scholars, journalists and policy-makers cite history as a general guide to action (e.g. realism, deterrence, the dangers (or benefits) of armaments), or as justification for specific foreign policies. Proponents and opponents of intervention in Bosnia and Kosovo have attempted to legitimize their respective positions with reference to 1914, the Holocaust and Vietnam.

The scientific study of international relations fits best, if partially, with evolutionary biology. For fundamentally similar reasons, international relations theory will not be able to predict events, trends or system transformations in a useful way. But international relations theory, like its Darwinian counterpart, can attempt — as many scholars do — to develop theories of process to organize our thinking about the past. Like paleontologists reading the evidence of fossil beds, these scholars use documents and interviews with former policy-makers to evaluate competing theories, qualitatively and quantitatively. Using theories as starting points, they can also reconstruct the origins of revolutions, wars, accommodations and other international phenomena in cases where adequate contextual evidence exists about the goals, understandings and calculations of relevant actors and the

political environment in which they functioned. Explanatory theories that pass the same tests as evolution have a serious claim to scientific status.

International relations, however, differ in at least one major respect from biology. A robust theory of evolution is possible because until very recently the actors in this drama — plants, animals and other forms of life — knew nothing about the theory. Human beings devote enormous resources, individually and collectively, to understanding the nature of their environment. That understanding has led them to interfere with biological evolution in important ways. People started to domesticate and selectively breed animals at least 10,000 years ago. Intensive experimentation with crops started not long afterwards. In the 20th century we have utilized antibiotics and other medical techniques to interfere with natural selection, and knowledge of molecular biology to alter genetically a wide range of plants and animals. The next century may bring more radical forms of bioengineering, including gene substitution and more general manipulation of the human genome.

Human intervention in the processes that govern social and political relations has been even more striking. As a general rule, the more people think that they understand the environment in which they operate, the more they attempt to manipulate it to their advantage. Such behavior can relatively quickly change the environment and the rules that appear to govern it, possibly to the detriment of all those involved. The recent Asian financial crisis offers a good example. Rapid growth allowed some Asian countries to attract hundreds of billions of dollars of short-term international loans in the early 1990s. When short-term money managers began to lose faith in the Thai and South Korean economies, the IMF pressured their governments to maintain exchange rates by raising interest rates to restore investor confidence. Such a strategy had often worked in the past, yet the more Asian governments tried to defend their currencies, the more panic they incited. Money managers hastened to withdraw their funds before local currencies collapsed. Urged by the IMF and Washington, the Russian, South African and Brazilian economies subsequently pursued the same policy with similar, disastrous results. In the aftermath, the IMF and many prominent economists came to recognize that greater sophistication on the part of investors and the greater mobility of capital had changed the rules of the game. They needed different strategies to cope with the problem of investor confidence (Sachs, 1998; Radelet and Sachs, 1999).

Knowledge of structure and process also allows conscious and far-reaching transformations of social systems. Smith, Malthus and Marx described what they believed to be the inescapable 'laws' that shaped human destiny. Their predictions were not fulfilled, at least in part, because their analyses of

economics and population dynamics prompted state and corporate intervention designed to prevent their predictions from coming to pass. Human prophecies — which are a form of prediction — are often self-negating.

A similar process has occurred in international relations. Prodded by two destructive world wars and the possibility of a third that might be fought with nuclear weapons, leaders sought ways to escape from some of the deadly consequences of international anarchy and the self-help systems it seemed to engender. They developed and nurtured supranational institutions, norms and rules that mitigated anarchy and provided incentives for close cooperation among developed states. Gradually, the industrial democracies bound themselves in a pluralistic security community. The same concerns ultimately played a significant role in bringing the Cold War to a peaceful end. Influential figures in both camps came to recognize the dangerous and counterproductive consequences of arms races and the sustained competition for unilateral advantage. With Gorbachev acting as a catalyst, the superpowers transformed their relationship and by extension, the character of the international system.

To the extent that actors can, wittingly or unwittingly, change the 'rules of the game', and even the nature of the political and economic systems in which they operate, general theories of process in international relations will have restricted validity. Unlike theories of evolution, they will not apply to all of history, but only to discrete portions. It seems self-evident but needs to be emphasized — scholars need to specify carefully the temporal and geographic domains to which their theories are applicable. We suspect those domains are often narrower and more constrained than is generally accepted.

A second big difference between international relations and evolutionary biology is the purpose of the endeavor. International relations scholars cannot predict the future, but neither can we ignore it. People need to make decisions in the face of uncertainty about the future, and consequently they need appropriate concepts and foci for information to maximize the quality of those decisions. As deductive-nomothetic theory is of very limited utility for this purpose — something policy-makers have known for a long time — scholars need to develop some other, more useful method if we are to have any influence as a profession on important policy dilemmas.[7]

Policy-relevant social science considers the general *and* the particular, and goes back-and-forth between them to make sense of social reality.[8] At the general level, we have numerous (if fundamentally untestable) propositions and less formal understandings of some of the conditions in which war and peace may be more likely to occur. With regard to war, historians and social scientists alike have distinguished between need- and opportunity-based resorts to force and have identified different sets of conditions associated

with each. These include, but are not limited to general power capabilities, the military balance between states and alliances, expected shifts in any of these balances, and domestic problems that threaten leaders, regimes or states themselves. More broadly, decisions to use force also appear to be influenced by the general state of regional and international affairs, dominant moral and intellectual conceptions and salient historical analogies. We need to treat all these factors as defining possibilities in particular circumstances; but no combination of them can predict what choices real actors will make.

Concreteness requires culturally local knowledge, because states, ruling elites and individual leaders respond differently to similar combinations of threats and opportunities. Incentives ultimately are in the eye of the beholder. Leaders may also respond differently to similar stimuli before and after experiences that transform their identities or understandings of ongoing strategic interactions in which they participate. We need better tools to wed general knowledge about international relations and foreign policy to the more specialized knowledge that area and country experts have about actors in specific conflicts and contexts.

Forward Reasoning

The logic of our argument suggests that point prediction in international relations is virtually impossible. Evolutionary biology is not a tool for explaining current 'trends'. It is not even a very good tool for identifying relevant trends until fairly long after the fact, because such a multitude of forces and random interactions determine the course of evolution. As we have argued, social scientists cannot afford the luxury of only examining the past, but are deeply engaged in the attempt to explain the present and think analytically about the future. Our interest is in the identification and connection of chains of contingencies that could shape the future. Fortunately, thinking about international relations as more like biology than classical physics or neoclassical economics does not necessarily require the adoption of an evolutionary epistemology or method.

One useful alternative approach is the development of scenarios, or narratives with plot lines that map a set of causes and trends in future time. This forward reasoning strategy is based on a notion of contingent causal mechanisms, in opposition to the standard, neo-positivist focus on efficient causes, but with no clear parallel in evolutionary biology. It should not be confused with efforts by some to develop social scientific concepts directly analogous to evolutionary mechanisms (such as variation or selection) in biology to explain, for example, transformations in the international system

or institutions, or conditions for optimum performance in the international political economy.[9]

Scenarios are not predictions; rather, they start with the assumption that the future is unpredictable and tell alternative stories of how the future may unfold. Scenarios are generally constructed by distinguishing what we believe is relatively certain from what we think is uncertain. The most important 'certainties' are common to all scenarios that address the same problem or trend, while the most important perceived uncertainties differentiate one scenario from another.

This approach differs significantly from a forecasting tournament or competition, where advocates of different theoretical perspectives generate differential perspectives on a single outcome in the hope of subsequently identifying the 'best' or most accurate performer. Rather, by constructing scenarios, or plausible stories of paths to the future, we can identify different driving forces (a term that we prefer to independent variable, since it implies a force pushing in a certain direction rather than what is known on one side of an 'equals' sign) and then attempt to combine these forces in logical chains that generate a range of outcomes, rather than single futures.

Scenarios make contingent claims rather than point predictions. They reinsert a sensible notion of contingency into theoretical arguments that would otherwise tend toward determinism. Scholars in international relations tend to privilege arguments that reach back into the past and parse out one or two causal variables that are then posited to be the major driving forces of past and future outcomes. The field also favors variables that are structural or otherwise parametric, thus downplaying the role of both agency and accident. Forward reasoning undercuts structural determinism by raising the possibility and plausibility of multiple futures.

Scenarios are impressionistic pictures that build on different combinations of causal variables that may also take on different values in different scenarios. Thus it is possible to construct scenarios without pre-existing firm proof of theoretical claims that meet strict positivist standards. The foundation for scenarios is made up of provisional assumptions and causal claims. These become the subject of revision and updating more than testing. A set of scenarios often contains competing or at least contrasting assumptions. It is less important where people start, than it is where they end up through frequent revisions, and how they got there.

A good scenario is an internally consistent hypothesis about how the future might unfold; it is a chain of logic that connects 'drivers' to outcomes (Rosell, 1999: 126). Consider as an example one plausible scenario at the level of a 'global future' where power continues to shift away from the state and towards international institutions, transnational actors and local communities. The state loses its monopoly on the provision of security and basic

characteristics of the Westphalian system as we have known it are fundamentally altered. In this setting, key decisions about security, economics and culture will be made by non-state actors. Security may become a commodity that can be bought like other commodities in the global marketplace. A detailed scenario about this transformation would specify the range of changes that are expected to occur and how they are connected to one another. It would also identify what kinds of evidence might support the scenario as these or other processes unfold over the next decade, and what kind of evidence would count against the scenario. This is simply a form of process tracing, or increasing the number of observable implications of an argument, in future rather than past time. Eventually, as in the heuristics of evolutionary biology, future history becomes data. But instead of thinking of data as something that can falsify any particular hypothesis, one should think of it as something capable of distinguishing or selecting the story that was from the stories that might have been.

The scenario methodology has seven steps — identify driving forces; specify predetermined elements; identify critical uncertainties; develop scenarios with clear 'plot lines'; extract early indicators for each scenario; consider the implications of each scenario; and develop 'wild cards' that are not integral to any of the scenarios but could change the situation dramatically if they were to happen.

Driving forces are the causal elements that surround a problem, event or decision. While some driving forces are likely to derive from standard causal arguments in major social science theories (e.g. the diffusion of power and the growth of commodities markets), others are not. In developing explanations for past events it is common to identify only a few, even two, driving forces. We call them 'independent variables' which implies, of course, that they are somehow independent (of each other and of other causes). In generating scenarios the starting point is to put on the table multiple driving forces that can be the basis, in different combinations, for diverse chains of connections and outcomes. Parsimony comes later, after not before an analysis of complex causal possibilities.

Predetermined elements appear relatively certain. They are parameters that can safely be assumed for the scope and span of the scenario exercise. One goal of a scenario is to separate what appears certain, or very close to it, from what people simply think or believe is likely, without engaging in well-established psychological processes of treating routine events, 'causes' of 'effects' and 'structural' causes as immutable.[10]

There are no easy experiments and control situations in world politics, but we can still assert with confidence that some developments appear nearly certain. Examples include slowly changing phenomena, like demographics, and constraints like geography and physical resources. We nevertheless need

to be very careful in categorizing elements as certain. In the 1970s, experts assumed that oil reserves were rapidly becoming depleted, only to be surprised by new discoveries. It seems reasonably safe, however, to assume that new water will not be discovered in the Middle East, and that limited supplies constitute a real source of friction between Turkey and Syria and Israel and the Palestine Authority. We must be even more cautious about political 'certainties' and 'social facts'.[11] In the 1970s many theorists treated as given intense and ongoing conflict between Egypt and Israel, and between the United States and the Soviet Union. In both cases, scholars were profoundly surprised by the termination of these conflicts and the reshaping of the regional and international environments that resulted.

Critical uncertainties describe important determinants of events whose character, magnitude or consequences are unknown. This uncertainty can also be the result of unknown interaction effects among combinations of the predetermined elements. Scenarios highlight the critical uncertainties; the plot lines confront these uncertainties directly as connecting principles that pull the story together.

Standard social science theory 'testing' treats as mutable the 'independent variables' suggested by connecting principles that we already know well. In scenario thinking, plot lines have to work with the critical uncertainties rather than the other way around. This is often a serious challenge, because it is impossible to know in advance of the empirical data what combinations of driving forces might come together in a setting of multiple conjunctural causality to yield particular outcomes. Of course, it is precisely that challenge that makes the scenario method a valuable tool. The goal is to learn from the future (as it unfolds), not predict it. No set of scenarios captures a comprehensive picture of all possible causal combinations — nor is it necessary to do so. What are necessary are clear causal relationships, even if complex. These can be evaluated, and modified, in response to emerging data.

A *scenario plot line* is a compelling story about how things happen. It describes how driving forces might plausibly behave as they interact with predetermined elements and different combinations of critical uncertainties. Plots have their own logic — sometimes more than one logic — that drive the story forward and suggest the directions in which the uncertainties may resolve. The logic(s) may be drawn from standard international relations theories. For example, balance of power theory emphasizes the way in which a strong driving force (states' desire for independence and autonomy) interacts with predetermined elements (power configurations) and critical uncertainties (who will ally with whom) in an international system to produce outcomes. But this is not the only logic applicable to international relations.

Competing theories or approaches identify different drivers and may lead to different behavioral expectations. Moreover, all these approaches acknowledge the importance — sometimes determining — of elements outside their theory, such as processes of diplomacy and personalities and preferences of individual leaders. The advantage of the scenario method is that stochastic events, equifinality, multifinality and complex, conjunctural causation are no longer stubborn inconveniences that need to be minimized or simply ignored. They can be treated as natural and fundamental aspects of reality. This can be done by developing multiple scenarios, or scenarios with branching points, that capture the probabilistic nature of the arguments at play, without, however, having to attach essentially arbitrary probability estimates to the strength of particular 'variables' or different outcomes.

Plot lines draw on and ultimately depend upon the existence of regularities in social interaction, in world politics as elsewhere.[12] But they consciously place these regularities in a contextualized setting and thus make no claim to identify invariant ontological structures or laws.

Early indicators are observable and measurable attributes of the political situation that allow researchers to assess, as events unfold, the extent to which a scenario (or which part of a scenario) is coming to pass. Developing early indicators is an exercise in 'process-tracing', extrapolated into the future. If a particular set of driving forces were to become most important and lead to a given scenario, what would be some of the early indications that events were indeed unfolding along that particular path and not along another? The strategy is a modified version of the simple idea of increasing the number of observables that differentiates between one set of explanations and another in a verifiable way.[13] By doing so in future time, we reduce *post-hoc* determinism, and force ourselves to confront historical contingency in a creative manner.

Implications of scenarios are aimed explicitly at decision-making and choice. One of the valuable consequences of thinking about historical contingency in a disciplined way is that it forces people who are going to make decisions to ask what they would do if they found themselves in — or heading towards — a world different from the one they expect. Theory-based prediction compels decision-makers to make or justify a decision or strategy on the basis of a single point forecast (at best, with a range of uncertainty around it) whose accuracy cannot be known until after the outcome is known. With scenarios, actors can evaluate decisions against the most plausible scenarios in the current set, and then evaluate the likelihood of these scenarios as their strategy unfolds.

Considering at once the behavioral implications of more than one scenario helps to clarify the stakes, risks and uncertainties connected with any single course of action that an individual or a state might choose. In some

situations policy-makers may be able to adjust their strategies in response to information that indicates their expectations are not being fulfilled. In others they may be able to hedge effectively against several different scenarios. Tracking through the use of early indicators might also help leaders to recognize that their actions could be an important pivot or determinant of the kind of future that was likely to evolve. Obviously, a process like this that included early consideration of several plausible scenarios, and the different ways the critical uncertainties might combine, could have been very helpful to NATO political and military authorities before they chose to begin air strikes against Serbia.

Finally, designers of scenarios need to consider *wild cards.* These are conceivable, if low probability, events or actions that might undermine or modify radically the chains of logic or narrative plot lines. They might include assassinations, dramatic economic changes, and famines and natural disasters. Some wild cards could constitute extreme values on a familiar independent variable; others might be outside the realm of standard social science arguments. In either case, doing this prospectively could change our views on what variables should be a part of theory, or what an 'extreme' value actually is — since it avoids the possibility of *post-hoc* certainty. It would also be revealing if we were to miss entirely a wild card type cause, or if what we thought of as potential wild cards happened but were 'dampened out' in their effects by other events.

A central choice in developing scenarios is whether to begin with drivers — the 'causal forces' or the plot line in the story — or the outcomes or resolution of the stories. There are several reasons to start with drivers. From the perspective of traditional social science, it is cleaner in principle to reason from cause to effect when possible. Pragmatically, scenario thinkers are more likely to generate results that contain surprises or challenging combinations of events when they begin from beliefs or ideas about fundamental causes, rather than from preconceived notions of the most likely outcome states. People who work on particular problems and have done so for a long time typically carry around in their heads a set of plausible outcomes, or 'official futures', that they believe are likely and relevant to their concerns. One of the purposes of constructing scenarios is to encourage scholars and experts to think outside of these confines about plausible, different futures.

In summary, scenario thinking is disciplined by beginning with the identification of the several factors (causes) which scholars believe are most important to the future of a political relationship. They can then distinguish between what is most certain and what is most uncertain. Uncertainty in this context can mean that scholars are uncertain about the 'value' of the variable, or about the causal impact of the variable, or both. The three or four most important, uncertain causes can then be identified, as well as a

narrative explication of the key uncertainties at play and the nature of their possible interactions. These critical uncertainties become the basis of different plot lines. By assigning different 'values' to these variables, and combining them in different ways, scholars can reason to a set of plausible end-states. These end-states should be plausible within existing conceptual frameworks, but, when possible, challenging to 'official futures'. Scholars can then develop the narrative pathways that could generate the outcomes by moving from a highly abstract framework toward increasingly precise — and compelling — causal stories that specify assumptions, major drivers, limiting conditions and implications. As part of these narratives, scholars must specify the trends that weave through their stories, and can be monitored as time passes.[14]

A Forward Looking Research Agenda

This section applies the abstract understanding of a forward looking research strategy to major trends in international relations. We do not elaborate full scenarios here.[15] Instead, we identify what we believe to be three of the most important developments likely to affect international relations in the coming decades — the continued increase in intrastate conflict, further proliferation of weapons of mass destruction and an increasing privatization of security. Our purpose is to show how a forward-based method can be used to track, study and understand these trends in a disciplined way. We make no claim that fundamental controversies in social science can be thus resolved, although we are confident that constructive forward-based thinking can help to clarify some of the parameters surrounding those controversies and the nature of the disagreements at hand.

Distinguishing trends, drivers and outcomes can be conceptually difficult. The trends we identify may be outcomes caused by previous drivers, and also drivers of other outcomes, most notably fundamental changes in the international system. Indeed, we chose the three trends because we think they are likely to contribute to important change. The methodology of scenario construction allows us to monitor and revise our expectations. If indicators that we have specified with any one of these trends do not become apparent, we then re-examine underlying theoretical assumptions, and reformulate the scenario. In this sense, the method is rather like an anti-aircraft system, responding to feedback and readjusting its trajectory as history flies by.

Using scenarios as a research method, the goals of research expand to include not only the development of better explanations, but also identification of points of intervention, ongoing revisions of scenarios as events unfold, and the consideration and re-evaluation of salient causal pathways.

Scenario methodology also highlights how learning and feedback may change possible futures in dynamic ways difficult to anticipate. This research strategy could easily be applied to particular regions — South Asia, the Middle East — or to particular relationships. We chose instead to focus on trends that cut across regions to show the most general application of the research strategy.

Intensified Ethnic Conflict

For the most part, the most violent and pervasive conflicts in the post-Cold War period are within states, not between them. They nonetheless often become international when they spread across borders or draw in third parties as participants, would-be mediators or peacekeepers. While a great deal has been written on specific intrastate wars and the general trend away from interstate violence, deductive theory has made relatively little headway in explaining within-state conflict or in understanding how to prevent its eruption. In part, the problem stems from inattention. During the Cold War, theories of international politics developed concepts and categories centered on states and strategic relationships, which said little or nothing about ethnic and civil conflict. Despite this inattention, however, these conflicts were frequently an important foreign policy concern, a central contributor to superpower conflict and prominent on the agendas and consumers of the resources of international institutions. A complicating factor is that the latest round of ethno-nationalist conflict is occurring in an historical, strategic and institutional context markedly different not only from the last 50 years, but from previous historical periods when such conflict was more common.

Research outside of international relations has uncovered a wide range of causes of inter-group conflict and violence.[16] These usually focus on local conditions that may cascade toward or trigger conflict — ancient hatreds, manipulation by belligerent leaders, or fear-driven local security dilemmas between ethnic groups in the same territory.[17] Despite recent attempts by international relations scholars to incorporate these causes into their theories, complex interactions among a changing international institutional environment, relationships among major powers and evolving local conditions create a formidable challenge. For reasons we have made clear, deductive theories are unlikely to capture the complexity of the interactions among the relevant factors. Nor are they likely to predict communal conflict. Consequently, deductive theories will contribute little to prevention or to the limitation of human suffering produced by such conflicts. A more modest and useful strategy would be to draw on past cases — Rwanda, Bosnia, Somalia, Sudan — to map the multiple paths to ethno-nationalist

conflict, identify the contingencies and wild cards that played out, and construct several scenarios of communal conflict, each highlighting a different critical uncertainty.

Generalizing on the basis of the past is not enough. Conditions change, and belligerents may learn lessons, confounding the expectation that strategies that succeeded in the past will work in future conflicts. The lessons learned from Bosnia did not provide an adequate map for anticipating or responding to the crisis in Kosovo. Unanticipated responses, 'wild cards' such as the accidental bombing of the Chinese embassy, and the complex interactions of local and external events require the consideration of new branches and new paths. Through scenario construction, analysts recognize that 'causes' may interact in unexpected ways and are sensitized to cues when events begin to track down alternative paths.

The scenario building strategy begins with driving forces and traces through causal pathways as these drivers interact in specific circumstances. Causal drivers of ethno-nationalist conflict might include the breakdown of empires, the proliferation, evolution and fragmentation of identities, and/or underlying demographic or environmental stresses caused by population growth and resource scarcity.

The breakdown of empire is an example of a driving force derived from social science theory (Lasswell, 1935; Emerson, 1960; Henderson and Lebow, 1974; Kupchan, 1994). When empires decay or collapse they can provoke intense conflicts by former minority groups attempting to create successor states. The competition of two or more groups for the same territory has led in this well-known dynamic to some of the most intractable struggles of the 20th century. The most acute variants involve successor states that have arisen from partition or have been subsequently partitioned. The end of the British Empire half a century ago left in its wake ongoing conflicts that still include Northern Ireland, India and Pakistan, Greeks and Turks in Cyprus, and the Israeli–Palestinian conflict. The collapse of the Soviet Union has generated similar conflicts along its former periphery — Armenia-Azerbaijan, Moldava — which give every indication of becoming intractable. The disintegration of Yugoslavia might also be considered a by-product of the Soviet collapse, with a smaller but intense set of conflicts associated with the breakup of a central state. Scenarios might be constructed that take early cues from post-colonial conflicts and the presence or absence of various local causes, but then consider additional general and local drivers, in different combinations, to sketch out different plausible trajectories of conflict.

International norms are a more mutable driver that falls under the 'critical uncertainty' category, and thus need to be tracked. Sometimes they evolve slowly enough so that they can be treated as givens. However, they also may

change rapidly, as many have following the Cold War. Norms of humanitarian intervention are undergoing a particularly rapid period of evolution. Although sovereignty has never been absolute, the evolution of norms of intervention appears particularly uncertain as spheres of influence have disintegrated, global civil society has increased pressure on the international community to intervene when gross violations of human rights occur, and fear of mass migrations and spillovers of conflicts have increased. Since such norms remain uncertain and not deeply embedded in international institutions and structures, it is impossible to predict which crisis will evoke an international humanitarian response. Alternative scenarios would weigh this humanitarian impulse differently and explore different catalysts.

The interaction of leaders and domestic politics with changing international norms is even more contingent. The 'Somalia Syndrome', for example 'taught' US leaders not to commit ground troops in an unstable local environment, and thus significantly affected subsequent decisions in Haiti, Rwanda, Bosnia and Kosovo. In May 1994 the Clinton administration issued new restrictive guidelines on humanitarian intervention, in the midst of the most intense genocide of the late 20th century in Rwanda. The new guidelines enabled the United States to not only stand aside, but also to discourage states and international organizations from timely and active intervention. One senior State Department official, highlighting the problem of feedback and agency in paths to conflict, noted 'It was almost as if the Hutus had read it [the guidelines]' (Weiss, 1995: 172).

Nor is it sufficient to focus on the response of a single state, even in the context of a highly skewed balance of power favoring the United States. President Clinton and his advisors, drawing on their — inappropriate — interpretation of NATO bombing in Bosnia, expected that a few days of bombing would compel President Milosevic to back down in Kosovo. The United States seemed to miscalculate the differential importance of Kosovo to Serbian identity and sovereignty, which made Serbians far more willing to suffer greater punishment to pursue their goals there than in Bosnia. Similarly, the United States did not appear to weigh adequately the apparent precedent of the NATO decision to China — the implicit endorsement of a much stronger norm of intervention and the explicit violation of a perceived firebreak around traditional norms of sovereignty. Beijing's concern intensified as the 'wild card' bombing of their embassy inflamed opinion. The 'branching' responses of other important players, under different contingencies, are important threads of nuanced scenarios.

Constructing scenarios also requires combining general lessons with local knowledge and sensitivity to temporal considerations. For example, Lapidus (1998), writing on Chechnya, has argued that, early on, as tensions increased, greater attention and sensitivity to Russian interests and vulner-

abilities would have increased the space for Western diplomacy. Her analysis is contrary to a more general expectation that ethnic conflicts involving major powers are immune to even direct diplomatic intervention by other powers or the international community. Intervention of any sort did become much more difficult after Russia resorted to military force in December 1996. Her analysis points to fluid and interacting domestic and international forces that need to be tracked in determining which opportunities and constraints operated at different times in different cases.

The metaphor of disease, illness and decline, initially suggested by Thucydides, and more recently by Bobrow for analyzing insecurity, fits nicely with our approach to forward reasoning. As Bobrow (1996: 446) puts it, 'Implicit or explicit strategy recommendations should then carry warning labels. They also should be subject to continuing monitoring for adverse consequences.' They may have adverse side effects, and their use can sometimes produce immunities that make them ineffective in the future. Peacekeeping, for example, can lessen urgency for serious negotiations. Worse still, humanitarian efforts, peacekeeping and safe havens in Bosnia may have prolonged conflict, and, by creating ethnic enclaves, even assisted Serbs in ethnic cleansing.[18] That is not to say that more forceful intervention might have had different results. Forward tracking and careful monitoring can help to expose where and why policies veer from anticipated trajectories and can highlight critical points of intervention as new 'branches' emerge.

Recent work on resource scarcity and acute conflict (Homer-Dixon, 1999) offers a final example of a possible basis for a scenario-based approach to communal conflict that combines predetermined elements and critical uncertainties. Homer-Dixon maps the relationship between apparently unalterable trends such as demographic pressures or depletion of natural resources and their impact on local social and political conditions to produce potential conflict. He argues that environmental scarcity constitutes an understudied set of variables that may be an increasingly important underlying cause of acute violent conflict, although, he cautions:

> The relationship between environmental factors and violence is complex. Environmental scarcity interacts with factors such as the character of the economic system, levels of education, ethnic cleavages, class divisions, technological and infrastructural capacity and the legitimacy of the political regime. These factors, varying according to context, determine if environmental stress will produce the intermediate social effects [poverty, inter-group tensions, population movements, and institutional stress and breakdowns]. Contextual factors also influence the ultimate potential for conflict or instability in a society. (Homer-Dixon, 1996: 45)

Homer-Dixon's candid assessment of the limits of the causal claims of his research identifies many of the problems of research informed by the ideal

of the covering law — uncertain relationships between underlying and immediate causes, open systems, complexity, negative degrees of freedom, and feedback and learning.

A pragmatic and effective approach to these problems would be to conceive of causal linkages as one set of drivers and to use these drivers to develop scenarios of possible futures, specifying the intermediate steps and branches along the way. The project could begin with the same causal variables Homer-Dixon identifies, but work with the assumption that these multiple possible causes of environmental scarcity, including constrained agricultural productivity, migrations and social segmentation, can interact in unanticipated ways with unexpected contingencies to complicate the paths to conflict and create new branches. Such a strategy works with, not against, the findings that 'the causes of specific instances of violence are always interacting sets of factors, and the particular combination of factors can vary greatly from case to case' and are 'often unique to the society in question' (Homer-Dixon, 1999: 7, 178). What is critical is a well-specified set of indicators that can track 'evolution'.

These putative causal linkages are 'emplotted' storylines that can be analyzed in particular cases,[19] but require sensitivity to feedback, interventions, surprises or 'wild cards', and the recognition that other drivers are equally plausible. Refinement and validation of hypotheses is unlikely, for reasons that we have made clear, to produce a definitive causal story that can be stated as a deductive explanation of a law. Similarly, no generic nor off-the-shelf strategies of intervention or assistance are likely to prevent trajectories that appear to be moving down the path toward conflict. But a disciplined forward reasoning approach could assist decision-makers. Context-specific scenarios could provide early warning of dangerous trends and sensitize analysts to local contingencies. Leaders could become aware of the plausibility of more than one future, design strategies of intervention, and test these strategies for robustness and adaptability against different scenarios.

Nuclear Proliferation

The unexpected nuclear tests in India and Pakistan in the spring of 1998 quickly altered the security environment in South Asia and beyond. While proliferation of nuclear weapons — or weapons of mass destruction, more broadly — has been neither as uncontrolled nor as limited as pessimists or optimists predicted, the explosions in South Asia highlight the importance of contemplating multiple causal pathways and multiple implications in the face of uncertainties and 'wild cards'.

The nuclear tests pose serious conceptual and policy challenges (Stein, 2000a). Many causes of proliferation have been suggested. While strategic

environments matter — no state without serious enemies has proliferated — many states with enemies have not (Argentina, Brazil) while others have relinquished nuclear weapons (South Africa, some former Soviet Republics). There is a diverse set of explanations of why states choose not to develop weapons — the effective use of carrots and sticks by major powers; the power of 'taboos' on weapons of mass destruction; and decision-makers' specific calculations of whether the risks from increased security dilemmas or being a possible target of preventive war outweigh the possible gains of nuclear weapons. In addition to explanations that focus on external calculations, domestic political factors increasingly appear important as well. For example, Etel Solingen (1994, 1995) argues that liberalizing domestic coalitions, as opposed to more nationalistic or fundamentalist coalitions, are more likely to favor nuclear disarmament in order to strengthen the international economic ties on which they rely.

Separate from the puzzle of proliferation itself are the competing analyses of the consequences of proliferation, both regionally and globally. A number of broad-brush scenarios of possible futures already exist in the literature. In the 1960s, Herz (1968) wrote of 'neo-territoriality', a future in which sovereign states recognize their interests in mutual respect for each other's independence but also the need for extensive cooperation. Herz argued this kind of cooperation would become possible when the danger of nuclear destruction made all people and societies on the globe recognize their interdependence and their common fate. Interestingly, this scenario was a revision of his earlier argument that the nation-state would decline with the advent of nuclear weapons technology (Herz, 1957). The evolution of Herz's thinking is very much consistent with the forward reasoning approach we propose — he recognized that the causal driver of nuclear technology produced unanticipated consequences and interacted with nationalism and state legitimacy in unanticipated ways. The outcome was retrenchment rather than demise of territoriality.

Following a similar logic, Deudney (1995a, 1995b) has presented a functional theory of how the international system might evolve into a global 'Philadephia System', similar to the governance arrangement that he argues prevailed in pre-Civil War United States, 1787–1865. He calls this 'negarchical' republicanism, residing between anarchy and hierarchy, where certain functions such as the control of nuclear arsenals might be embedded in cooperative institutions or multiple-actor command systems while territorial units might maintain authority over other functions. Although Herz's and Deudney's scenarios appear far distant in the future, creative and disciplined thinking of this kind pushes forward the conceptualization of causal drivers that might lead to these outcomes and helps us to assess if and when we are on such a path. It would be worthwhile for Deudney to build

in additional drivers and uncertainties to assess factors that open up or close off ways to get to preferred futures.

There are also nuclear optimists like Waltz (1981) and Mearsheimer (1990) who argue from neorealist premises that proliferation will produce greater stability in a multipolar world. More nuanced studies also propose starkly different scenarios, as a recent debate on the pages of *International Security* between 'optimists' and 'pessimists' of the effects of proliferation attests.[20] It is worth noting that with the exception of the apparent certainty displayed by Waltz and Mearsheimer, both optimistic and pessimistic scholars recognize that, 'nuclear strategic logic is occasionally indeterminate or at least multifaceted, and . . . that many factors determine nuclear behavior' (Feaver et al., 1997: 186). Pessimists and optimists seem to agree that deductive theories based on the Cold War experience are unlikely to apply as proliferation — or non-proliferation — proceeds. Sagan, a 'pessimist' about the effects of proliferation, harshly criticizes early post-Cold War scholarship because it was dominated by 'purely deductive arguments based on the logic of rational deterrence theory [that] eschewed the kind of historical research that is necessary to test theoretical arguments about the strategic effects of nuclear weapons' (in Feaver et al., 1997: 193). Similarly, Feaver notes the need to supplement theoretical reasoning about US or Soviet strategic behavior during the Cold War with 'attention to causal relationships that drive the real-world behavior underlying observed outcomes'. Careful attention to contingency in context allows the drivers of Soviet and American behavior during the Cold War — domestic politics, cognitive traps, trade-offs inherent in command-and-control — to be embedded in scenarios of future proliferation, but 'in some cases, revised as new data becomes available' (Feaver et al., 1997: 186). Karl, a critic of Sagan and Feaver, stresses the need 'to go beyond rote arguments over whether proliferation is good or bad and undertake empirical investigations into the actual behavior of new nuclear powers' (Karl, 1996/7: 119).

Scenarios of the consequences of proliferation can make use of and build in a very helpful tool — competing game theoretic models — to identify cryptic and possibly critical dynamics of an important real world problem. Multiple nuclear powers with potentially opaque nuclear strategies and uncertain command-and-control systems are unlikely to operate as the simplest classical models predict. Scenarios might also highlight the different factors on the path to preventive war or military strikes in potentially unstable regions like the Middle East. Would an Israeli air strike against a nuclear reactor in Iran today produce the same muted response as did the strike on Iraq in 1981? This is not a question that could be answered by analogy or inference from any general theoretical understanding of international relations. Playing out different scenarios, with the help of game-

theoretic models that emphasize part of the strategic logic embedded within them, might highlight dangers of alternative strategies, unexpected consequences under different contingencies, and opportunities to reduce tensions.

Privatization of Security

Developing scenarios about the future is not simply a matter of identifying multiple drivers. At times, it may involve detecting a shift in the conceptual terrain itself, which would make nomothetic deductive theories all the more problematic. A growing body of international relations scholarship has pointed to the shifting ground of sovereignty (e.g. Ruggie, 1993; Kratochwil, 1995; Biersteker and Weber, 1996; Strange, 1996). Identification of this conceptual shift has, however, had very little impact on mainstream 'scientific' theories, largely because analysis of 'international conflict' rests on a Weberian conception of the state as the monopolizer of force.

The capacity to provide security as a public good to citizens has been both constitutive and defining for the modern state.[21] It has been constitutive insofar as war-making by the state directly and indirectly expanded its capacity to provide other public goods at home, and it has been defining in the sense that citizens gave their loyalty to the state as their most important shield (Tilly, 1975). The most far-reaching implications for the future of international relations stem from the possibility that this understanding of the state no longer applies. This reformulation of the role of the state suggests that private security, supplied by the market, grows in relative importance to public security supplied by the state.

Drivers of such a trend can already be identified. For example, in many parts of the world, fear of nuclear and even conventional war has declined precipitously. Citizens, no longer seized with the fear of nuclear war, have begun to think beyond physical security and to shift their agendas from the public to the private. Herz's and Deudney's propositions also drive in the direction of disaggregation of the security function of the state. Additional drivers include the effects of global markets, which put pressures on states to disengage as providers of other public goods; the state becomes instead a regulator of the rules of the game or a supplier of competitive advantage.

New identities proliferate in such an environment. As security from attack abroad becomes less of a preoccupation than at any time in recent historical memory, the situational triggers that traditionally activate and affirm identification with the state are likely to decline in frequency. The disaggregation of security, when combined with the rise of an elaborate set of supranational institutions, may further disengage people from their connection to the state. If the state is not the only supplier of security, its

command of the loyalties of its citizens that separate them from the 'other' in different countries may diminish.

Evidence already exists that drivers along this path to privatization are active. For example, the capacity of the state to protect its citizens at home has also declined, although it has declined in different regional spaces for quite different reasons. In the United States, the rise of 'gated' communities with private security systems contained behind walls is quite remarkable. Many large institutions — banks, schools, hospitals and universities — now use private security forces to secure their local populations. It is not the state that secures its more privileged citizens from violent attack, but privately organized and financed security systems available in the market. Even public security providers are being contracted to the private sector to augment budgets. At the extreme, in Moscow, private suppliers of security serve organized crime even as the capacity of the state to protect its citizens crumbles. Such trends have wide implications. Private markets for security over the long term will advantage the affluent and diminish identification with the state across social boundaries. While borders of states become less important, divisions within society may deepen if markets rather than states provide security. Political identities will be reshaped over time by the declining importance of state borders, and the growing importance of boundaries for private security markets.

The privatization of security is not restricted to the emergence of markets to supply the needs of the affluent within post-industrialized societies. In the wake of the end of the Cold War and the decline of empire, the major powers have progressively disengaged from regions they no longer consider to be of central strategic interest. Caught in a security vacuum, weak states have fragmented, especially in parts of Africa, but in the former Soviet Union and Latin America as well. In Colombia, the state military, private paramilitary forces and several guerrilla organizations compete to provide contracted protection to multinational corporations. Some of these fragmenting states no longer have the capacity to provide security for their populations; on the contrary, civilian populations are deliberately targeted by competing militias that supplant the forces of the state.

As state capacity to provide security declines, and international institutions retreat from the challenge, private suppliers of security increasingly fill the gap. At times they are contracted by international institutions, more often by states who seek to augment their capacity to coerce their own populations, and at times by non-governmental organizations who seek access to insecure and desperate populations that are being systematically victimized by predatory militias. Private security markets are expanding in the shadow of fragmenting states and unwillingness by the major powers and international institutions to supply security as a collective good (Stein, 2000c).

The privatization of security, if it continues to widen and deepen, is likely to reshape the role of the state and shift political identities in global political space. The state, no longer the exclusive supplier of security, becomes one among several focal points of political identity. Borders, no longer the only or even the most important shield against attack, are likely to become increasingly less important as anything but a juridical divide between states, while boundaries — cultural and social divisions among spaces — drawn by private security markets are likely to become more important. These boundaries will not be as stable as state borders were in the 20th century, because they are constructed out of market allocation not political authority. Nor will private purveyors of security be the focus of the kind of political loyalty that states were able to command.

We are not suggesting that this future will come to pass, or that it is the only plausible future. Rather, laying out such a scenario encourages students of international affairs to consider a range of drivers, to identify the critical uncertainties, to develop different plot lines by varying these uncertainties, and to develop indicators of different paths to monitor trends as they unfold. Just as counterfactual analysis is a useful tool for evaluating the strength of competing explanations and recognizing the contingency of outcomes that actually occurred, forward reasoning opens our analyses to the possibilities of alternative futures, but forces discipline in tracing likely paths created by important drivers in combination with significant uncertainties.

This analysis of plausible futures suggests that the nature of the units, identities, and key characteristics of the system can change. At least two of the trends we have identified — continued increases in intrastate conflict and privatization of security — suggest the need to reconceptualize the basic units of analysis as identities and the nature of human agency change. Some scholars have begun this reconceptualization of political actors. Ferguson and Mansbach,[22] for example, note that polities command loyalties of individuals and groups, but remind that the sovereign state is only one of the many forms and identities polities have taken over the ages. Multiple identities — whether ethnic, national, religious, professional, class or ideologically based — and competing pressures for people's loyalties are nearly always present. This kind of reconceptualization of political actors and identities provides another starting point for analysis otherwise closed off by deductive theories that posit relationships between given (usually state or national) actors. Different scenarios can be developed using particular conceptualizations of polities or actors as starting points, with analysis of critical uncertainties folded in to different paths and plausible outcomes. These scenarios can be monitored along with more 'conventional' scenarios to assess where unfolding events fit best and where the 'storyline' needs to be adjusted. Using feedback from unfolding events, we can develop better

and more compelling narratives of the future as we proceed through the present.

Conclusion

Newtonian physics conceived of a world of clock-like regularities that could be discovered through deductive theory and empirical research. Prediction was a reasonable goal because many of the phenomena studied by 18th and 19th century physicists were the result of a few easily measurable forces or of interactions among an extraordinary large number of units that gave rise to normal distributions. Neither of these conditions prevail in international relations — or in much of modern physics.

Evolutionary biology is shaped by a multitude of forces and quasi to fully random events whose interaction cannot be modeled. Evolutionary biologists do not aim at prediction but instead have focused their efforts on developing theories that explain the process and history of evolution. They have met with considerable success.

We believe that international relations is closer, in its basic nature and amenability to scientific study, to evolution than it is to mechanics or fluid dynamics. Like evolutionary biology, most kinds of prediction in international relations are impossible. Theories of structure and process — if we had robust theories — would fail to capture some of the most critical factors responsible for political outcomes because, as in evolution, they would lie outside any of the theories.

Scenario-based forward thinking is a promising method for tracking the policies of actors and the evolution of the international system. Scenarios allow researchers to combine general knowledge of politics with expert knowledge of individual actors and situations, to build in context, complexity, variation and uncertainty in the form of multiple narratives with numerous branching points, and to revise their expectations as events unfold. Repeated iterations of this process can reasonably be expected to improve the quality of our general knowledge of international relations, our ability to track specific developments and the outcomes that result, and our capacity to address the problems that these evolutionary tracks create.

Why scenarios? First and foremost because theorists and policy-makers both need constructive ways to think about the future and parse out the uncertainties in an inherently unpredictable setting. This is necessary for intelligent action, but also for progressive improvements in theory-based understanding of world politics. The future is not predictable. Acknowledging this up front forces a theorist concerned with the biggest questions in social science to deal first with the boundary conditions around any

argument with efficient causes. As the recognized boundary conditions become more restrictive, which they are likely to rapidly do, contingent and complex causality is brought to the fore. We believe this is a good thing, even as it confounds the search for laws and invariant causal relationships.

Second, we propose scenarios because econometric models and logic cannot accommodate sharp discontinuities. Qualitative uncertainties — particularly uncertainties about the fundamental rules of the game or institutional structures — require a different type of thought process and evidence collection. Certainly there are theorists of international relations who maintain that there have been few sharp discontinuities in world politics over the last 300 years, but that position seems increasingly untenable to most. There are huge risks, theoretical and practical, in attempts to fit incoming evidence to existing theoretical paradigms when qualitative discontinuities may be present. Scenarios are one way to balance that risk.

A third reason to use scenarios is to provide a common vocabulary that helps to clarify the nature of disagreements. We have found in our work that a group of theorists generating scenarios about the future of the Middle East peace process divided along two dimensions of disagreement — contingent disagreements and fundamental disagreements.[23] Fundamental disagreements are the result of basic, almost primordial beliefs about the world and the nature of politics. These are probably irreconcilable by evidence. Contingent disagreements are the result of differences in beliefs about the boundary conditions under which certain relationships hold. Contingent disagreements can be gently pushed towards resolution with careful quasi-experimental research designs, but they first need to be identified as such. One of the key findings of our scenario process was that disagreements which theorists took at the start to be fundamental, were often revealed later in the process as contingent. This is an important, if small, step on the road to cumulation.

Finally, scenarios are useful because the theoretical study of international relations needs new ideas and arguments just as much as it needs to test existing ones. We are not opposed to the disciplined, precise evaluation of hypotheses and theories that are adequately developed so that they are ready for this kind of treatment. We are concerned about a search for false certainty and about the relatively trivial nature, and lack of policy relevance, of many 'big' generalizations. Scenario thinking, obviously, is not a panacea for this problem. It is a complementary toolkit that has promise for generating new ideas and arguments, broadening the range of causal relationships that we study, and tracking the evolution of world politics through periods of discontinuous change, in ways that promise to better over time both understanding and action.

Notes

1. Oskar Morgenstern (1972), one of the founders of modern game theory, argued that theory is useful in a practical sense, when it describes a relationship that can be shown to exist in reality. Bruce Bueno de Mesquita (1981) takes a similar stance.
2. We use evolutionary biology as an analogy for modes of reasoning, not as a model of politics per se.
3. The most recent COW (1998) data set includes 79 wars from 1816 to 1992, but it is unlikely that the causes or frequency of war would be constant across nearly two centuries marked by unheralded transformations of actors and systems through processes like nationalism, industrialization, democratization, imperialism, the development of weapons of mass destruction and the tighter political and economic coupling of once largely independent regions.
4. We state the rule in this way to avoid the confusion of 'affirming the consequent' (as in if X then Y) and thus to emphasize falsifiability.
5. See Weber, 'Counterfactuals Past and Future', in Tetlock and Belkin (1996).
6. For a recent statement, see Morris, 1998.
7. George, 1993 makes this point.
8. Carlsnaes, 1992, 1993 has made a similar argument.
9. See, for example, Modelski and Poznanski, 1996, and other contributions to the September 1996 special issue of *International Studies Quarterly*.
10. See 'Introduction,' in Tetlock and Belkin, 1996.
11. Searle, 1995, defines social facts as those facts produced by virtue of relevant actors agreeing that they exist. See also Ruggie, 1998.
12. For an effort to save the 'scientific' explanation while doubting the usefulness of of general laws for explaining social phenomena see Elster, 1989. See also Brown, 1984.
13. See for example King et al., 1994: 19, 28–9.
14. For a similar discussion of 'causality' embedded in a narrative explanatory protocol, see Ruggie, 1998: 89–94.
15. For how to construct scenarios, see Weber, 1997 and Stein, 1998.
16. For a classic treatment of ethnic conflict, see Horowitz, 1985.
17. For recent applications of various causal theories to the new wave of ethnic violence by international relations scholars, see the series of articles in the Fall 1996 issue of *International Security* (Snyder and Ballentine, 1997; Lake and Rothchild, 1997; Ganguly, 1997; Kaufman, 1997).
18. For a discussion of feedbacks and unintended consequences of interventions in the former Yugoslavia, see Pasic and Weiss, 1997.
19. Polkinghorne (1988: 19–20) uses the literary term 'emplotment' to describe causation embedded in narrative: 'It is not the imposition of a ready-made plot structure on an independent set of events; instead, it is a dialectic process that takes place between the events themselves and a theme which discloses their significance and allows them to be grasped together as parts of one story'. Cited in Ruggie, 1998: 94.

20. Feaver et al., 1997. On the general debate between optimists and pessimists, see Sagan and Waltz, 1995.
21. For an analysis of the privatization of security and its consequences, see Stein, 2000b.
22. Ferguson and Mansbach, 1996 See also Hall, 1998.
23. See Stein et al., 1998.

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