Chapter One

INTRODUCTION: WHY THE INTEREST IN NATIONAL POWER?

THE EMERGING INFORMATION TECHNOLOGY REVOLUTION

It is widely argued today that human societies are in the process of a momentous transition. Nearly three centuries into the industrial era—an era distinguished by, among other things, the dramatic substitution of mechanical for animal power and the ubiquitous presence of mass production—it is now believed that society stands on the threshold of a new age defined fundamentally by the presence of a science-based knowledge revolution. This idea, however, is by no means novel. As early as 1973, Daniel Bell, in a pathbreaking study titled The Coming of Post Industrial Society: A Venture in Social Forecasting, argued that there would soon emerge a society “organized around knowledge for the purpose of social control and the directing of innovation and change.”\(^1\) This idea, however, acquired a new lease on life, at least in the popular imagination, when the authors Alvin and Heidi Toffler asserted that the new microelectronics, data processing, data storage, and communications technologies now visible everywhere constitute nothing less than a “third wave” in the evolution of civilization.\(^2\) This “wave,” like the agricultural and industrial waves before it, is viewed as rooted essentially in the radical changes taking place in what Marx called “the mode of

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production in material life.” These changes derive as much from innovations in science and technology as they do from the pattern of economic relations within society: insofar as they are instantiated in the “information technology revolution,” they constitute a maturing of the “age of automation,” in which the combined computational and communicative power of networked computers promises to alter traditional organizational forms as well as the distribution of power within and among societies.

The emerging information technology revolution is, in the view of its proponents, both novel and significant. To be sure, the modern antecedents of these technologies go back to the 19th century, when the telegraph, the undersea cable, and the telephone first made their appearance and heralded a consequential transformation in military capability. They continued to mature through the invention of radio, television, and computers in the first half of the 20th century and acquired systemically revolutionary properties since the 1950s, when solid-state electronics and the silicon chip—together with all the innovations in microelectronics that these examples have come to represent—combined to set apart the last forty-odd years from all prior history. As one analysis summarized this dynamic,

since the 1950s, the means for communicating, processing, accessing, storing, managing, and exploiting information have exploded. No dimension of human affairs, including population or depredation of the environment, seems to have grown or changed so rapidly. In the past decade alone, measurement of the information revolution on almost any dimension—numbers (of telephone circuits, television receivers, videocassette recorders, video cameras, or facsimile machines), capacities (of transmission media, storage devices, or displays), speed, or cost—is described not in mere percentages, but in factors of three, ten or more.

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The novelty of such change would be merely interesting were it not for the dramatic economic and political significance attributed to it. The Tofflers, for example, elaborating on their grand metaphor of a “third wave,” assert that information technologies will in fact de-nature the industrial age insofar as information processing regimes will replace manufacturing as a source of wealth and growth. In this world view, now widely accepted throughout the United States, services will supplant manufacturing, hierarchic social structures will be replaced by “flat” or “networked” organizations, and in general the emphasis on “mass” production witnessed throughout the industrial era will be replaced by an emphasis on “customized” manufacturing, where efficiency is measured by the ability to satisfy multiple sets of smaller but more discriminating consumers.\(^7\)

More pertinent, however, these changes in the “the mode of production in material life” are seen to presage a military revolution as well. As the Tofflers’ popular work *War and Anti-War* succinctly argues, “this remarkable change in the world economy is bringing with it a parallel revolution in the nature of warfare,\(^8\)” since “the way we make war reflects the way we make wealth.\(^9\)” Thus, the changes in the system of producing wealth *inevitably* will bring in their trail “revolution[s] in the system for making war . . . ,”\(^10\) a hypothesis that seems to find considerable favor in the burgeoning literature on the “revolution in military affairs.”\(^11\) The expectations about this revolution’s implications for future warfare obviously run very high insofar as the new information technologies are seen as seeking not simply “to reduce the chance and uncertainty in war”\(^12\) but actually to replace “Caesar’s augury, Montecuccoli’s blend of science and mys-
ticism, Von Bulow’s enlightenment formulas, Clausewitz’s *coup d’oeil*, and Von Mellenthin’s *Fingerspitzengefühl*.13

Whether the new information technologies can actually fulfill these lofty expectations only time will tell, but in the meantime, it is possible to speculate that they might have three more clearly discernible effects. At one level, the revolutionary consequences for warfare brought about by emerging information technologies may materialize simply at a military-technical level in that information technologies could replace the current “dumb” weapons and traditional forms of military organization with alternatives that alter the “fundamental relationship between offense and defense, space and time, [and] fire and maneuver.”14 At another level, they may lead to new socially relevant forms of warfare such as “information attacks” on infrastructures like electric power, air traffic, financial links, and oil and gas networks that result in systematic neutralization of many critical grids without any physical destruction, at least in the first instance.15

At a far more fundamental level, however, emerging information technology could, it is often argued, lead to a restructuring of the political order itself, both within countries and between states.16 Such an outcome would be far more revolutionary than either of the two lower-order consequences identified above. In fact, some already see the epochal political revolutions in Eastern Europe during the 1989–1991 period “as the dramatic debut of a new era in which the sources of power and the nature of conflict are undergoing

13Ibid.
16A fascinating exploration of how the information technology revolution may impact the forms of political order can be found in David Ronfeldt, *Tribes, Institutions, Markets, Networks: A Framework About Societal Evolution* (Santa Monica, CA: RAND, P-7967, 1996).
a fundamental shift because of the networking and shrinking of the world due to the enormous increases in the flow of information.”\(^{17}\) If such a conception of what information technologies can achieve is true, it would not be surprising to conclude, as one thoughtful survey did, that “it seems not improbable that the power of information, in the hands of individuals, will come to be seen as a rival to that of the nation-state; that information can be used effectively to prevent war or to wage it; and that information can be exploited to perfect or destroy entire societies.”\(^{18}\)

**UNDERSTANDING NATIONAL POWER IN THE POSTINDUSTRIAL AGE**

It is against a backdrop of such considerations that the Office of Deputy Chief of Staff for Intelligence (ODCSINT), U.S. Army, tasked RAND’s Arroyo Center to undertake a conceptual examination of how national power ought to be understood in the context of the technical and social changes taking place today. There was clearly a sense that new technologies, including those in the information arena and elsewhere, had generated nontrivial changes in the traditional bases of power and, as such, warranted a review of the extant conceptions of national power as well as the customary indices used to measure the power of countries. Three concerns in particular made such a reassessment particularly pressing.

First, there has been a growing unease with the current aggregate measures of national power used within the intelligence community and to some extent within the academic community as well. These measures, which focus largely on discrete variables like size of population, GNP, size of the armed forces, extent of land area, access to exploitable resources, and annual grain and steel production, all taken together provide a rough picture of gross national power that, however interesting and useful, still fails to capture critical details about a given country’s capabilities in international politics.

Second, there has been a growing suspicion that the nature of warfare itself may be changing in fundamental ways. These changes

\(^{17}\)Bankes and Builder, op. cit., p. 3.

\(^{18}\)Ibid., p. 4.
might in fact be occurring not simply at the interstate end of the conflict spectrum, as the “revolution in military affairs” theorists invariably point out, but also at the lower end of the spectrum. The changes here appear to materialize in the form of a resurgence in substatal conflicts and intrastate violence that often do not involve conventional military operations in the traditional sense. Thus, it appears quite unclear whether and, if so, how the traditional measures of national power are affected by such changes in the character of warfare.

Third, there has been increasing concern that the lack of an adequate methodology to assess national power might cause the United States to miss or misinterpret incipient changes in power capability that may be taking place within many countries in the international system. This concern is clearly fundamental: it is rooted in a legitimate fear that the absence of a good metric for judging national capabilities might result in an intelligence failure that provokes either an inappropriate overreaction or underreaction—both of which could be problematic in different ways—on the part of the United States vis-à-vis other competing entities.

These three concerns acquire special resonance given the fact that countries like the Soviet Union and Iraq, which were classified as relatively significant powers by some aggregate indicators of capability, ultimately either collapsed through internal enervation or proved to be utterly ineffectual when their capabilities were put to the test in war. Both these examples suggest that appreciating the true basis of national power may require not merely a meticulous detailing of tangible military assets such as force inventories and logistics capabilities, but also an assessment of other intangible elements like training, doctrine, leadership, experience, readiness, and integrative skill. Even more importantly, however, it seems to suggest that standard measures of power like GNP and annual economic growth rates ought to be placed within a larger scrutiny that addresses issues like the external environment facing a country as well as the aptitude of its populace for innovation, the nature of its domestic economic and social institutions, the constitution of its state-society relations, the quality of its knowledge base, and the character of its ideational ethos—all of which conceivably bear upon a country’s capacity to produce the one element that is still fundamental to international politics: effective military power. To the
degree that contemporary intelligence methodologies lack information of this sort, they risk being shown up as deficient since gross or aggregate national indicators will provide important, but nonetheless incomplete and perhaps misleading, assessments of “true” national power.

This report represents a first cut at reconfiguring the notion of national power to accommodate a wider understanding of capability than is currently utilized in discussions about international affairs. It is by no means complete as an intellectual product, but it is nonetheless offered in the hope that it might be improved by the criticism of others or further developed by those with an interest in this subject. The principal intention here is to develop a conceptual framework for thinking about national power in the postindustrial age, a framework directed ultimately toward helping the intelligence community advance better evaluative measures for a country’s power capability. These measures are intended to inform the intelligence community’s judgment about the national capabilities of a few candidate great powers that could become true “peer competitors” of the United States at some point in the future: far from functioning as a scoring system that eliminates judgment, they are designed to incorporate and systematize the knowledge of country and regional analysts into a template that provides detailed information on national capacity that can then be compared across a small group of peers. This objective implies that the measures alluded to, or suggested, in this report will include both hard and soft factors, both traditional and nontraditional indices. The high level of detail is designed to capture the most important dimensions of a nation’s power, some of them derived from permanently relevant variables and others rooted in more novel factors that have acquired importance thanks to the peculiarities of the postindustrial age. Because of this detail, the overall framework is not intended to be used for cross-national comparisons on a large scale, but only for the close scrutiny of a few significant target states—one at a time.

The framework is intentionally not designed to provide “automatic” numerical scores about a country’s power capacity. Rather, it is advanced primarily to order a way of thinking about national power and thus is no substitute for the knowledge and judgment of various country specialists. With more work, it could certainly be winnowed down and further translated into the “essential elements of informa-
tion” of specific interest to the intelligence community, but as it currently stands, it is not a completed matrix that defines actual collection requirements. In fact, some of the data sought by the framework are not collected by the intelligence community at all; other data are collected by academic and research institutions but need further evaluation and analysis by the intelligence community to be useful; still other data called for may simply be too complicated or too difficult to collect, but are nonetheless identified because they relate to certain elusive variables that are important for understanding national power. Even if all these data were available, however, this framework will still not allow any “automatic computation” of a country’s power. Any framework that enabled such computation would of necessity be sparse and parsimonious. By virtue of this fact, it would also not generate the detailed “national power profile” that the intelligence community seeks in order to make critical judgments about whether certain “candidate great powers” are on the cusp of becoming true “peer competitors” of the United States.

Since this framework is fundamentally oriented toward helping the intelligence community create such a standardized power profile of certain key countries of interest to the United States, it must—almost by definition—be sufficiently detailed while leaving room for the specialized knowledge that country specialists and regional analysts will invariably bring to bear in the production of any strategic assessments. The purpose of this framework, in the first instance, is therefore heuristic: it is meant to identify what a comprehensive understanding of national power requires in the postindustrial age and, to that degree, is intended to contribute toward the discussions now taking place in the intelligence community about what the appropriate measures of national power ought to be. In the final instance, however, it is intended to supply an intellectual “template” that, if found suitable and after further modification, the intelligence community could use to define future collection requirements for purposes of constructing power profiles of key target countries important to the United States.

If the framework advanced in this report, therefore, succeeds either in highlighting some critical dimensions of national capability that usually tend to be overlooked or in identifying some useful nontraditional measures of power that have acquired importance in the postindustrial era, it will have served its purpose. This purpose, fun-
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Fundamentally, consists of being able to capture a comprehensive view of power that helps distinguish “truly” powerful from only “apparently” powerful countries in a format that can be standardized for purposes of intelligence collection and comparison across a few relevant cases. Truly powerful countries are those that: possess, and invest in producing, significant levels of resources relevant to the postindustrial age; can engage in intense political-military competition with their peers over long stretches of time because their superior state structures and high ideational acuity allows them to extract and transform societal resources efficiently and on a large scale; and can develop and field highly sophisticated military forces that are operationally competent at the most demanding operations mounted against a diverse variety of adversaries. Apparently powerful countries, in contrast, are those with large military forces: they may possess nominally sophisticated inventories of weapons, but their operational proficiency is an open question. The quality of their national resource base and their ability to efficiently extract and transform societal resources are similarly problematic, with the result that such countries often display an appearance of great capability even though the national and societal foundations of their power are quite hollow. Understanding the essence of national power, as opposed to merely the appearance of it, and capturing that essence in a standardizable format that enables data collection and comparison across a small number of candidate great powers, remain the fundamental motives beneath the development of the framework offered in this report. This research will best support the Army’s and the intelligence community’s efforts at long-range planning and global forecasting insofar as assessing the “true” capabilities of potential adversaries as accurately as possible is vital to adequately metering our own evolving military acquisitions, structures, and development.

THE NATURE AND CONTENT OF THIS REPORT

In developing this new framework for assessing national power, the intellectual presupposition is that the bases for generating effective power are changing in significant ways thanks to the knowledge revolution, especially as manifested today in information and other emerging technologies. This research effort, however, does not scrutinize in any detail the nature of this revolution itself or its
progeny, the revolution in military affairs. There is a vast and growing literature on each of these two issues, and wading into it in order to judge the debates that concern its protagonists—Is it a “revolution” or merely an “evolution”? How deeply is the “revolution” or “evolution” entrenched? What are its consequences for society and warfare?—would have taken the project too far afield to be of any use to its sponsors. Consequently, this research effort simply presumes that significant technological transformations are under way and that their broad dimensions are sufficiently discernible in both the civilian and the military realms. We have focused primarily on assessing what a given country must have if it is to effectively use the emerging knowledge revolution to produce the capabilities that will confer advantage in the arena of international politics. This assessment is then used to discern what measures relating to national capacity the intelligence community should focus on when developing its singular and comparative assessments of power.

The new conceptual framework set forth in this report has been developed in response to one deceptively simple tasking question: “How can the nature of national power be judged in this postindustrial age?” Or, empirically stated, “How would the intelligence community know if Country X was evolving into an effective peer competitor of the United States?” While the answer to these questions is described conceptually by means of the framework detailed in Chapter Four, the report attempts to situate this answer within a larger reflection of the nature of power itself and in the context of previous answers provided by scholars. Chapter Two identifies the conceptual considerations that must be faced when addressing the nature of national power. It begins by examining the abstract concept of “power” and then relates those considerations to the idea of “national power.” Chapter Three reviews several traditional approaches to national power found in the literature, describing what insights they sought to provide. Chapter Four provides a revised view of national power that attempts to expand on the prevailing view: specifically, it attempts to show how a more comprehensive view of national power must include not simply resources and military power of the kinds traditionally measured, but new ones as well. In particular, it argues that the crucial missing link—the transformative dimension consisting of the external environment,
the infrastructural power of the state, and the ideational resources of the polity—must be restored if a seamless assessment of national capability is to be obtained. Chapters Five through Seven elaborate the revised framework for measuring national power in three distinct realms: national resources, national performance, and military capability. They provide the analytical rationale for the various components held to be significant in the production of national power and suggest numerous indicators that allow measurement of the strength of these components. These indicators are primarily illustrative, but are offered as a starting point from which the intelligence community can define the “essential elements of information” (EEIs) it needs to guide its collection and analysis requirements. When viewed in their totality, the indicators are selected both to reflect the strength of the components essential to the production of national power and to provide internal cross-checks on the various data that ought to be collected. These indicators are summarized—with minimal analytical backdrop—in a companion document, RAND report MR-1110/1-A, for the convenience of various users in the intelligence community. Chapter Eight concludes the report by recapitulating the objective and the nature of the work and identifying the tasks for future research. Since this report provides a wide variety of empirical indicators interspersed with larger analytical arguments, the Appendix provides an abbreviated list of the most important quantitative indicators of national power in the postindustrial age. Drawn on the assumption that the intelligence community may not be able to collect and collate the diverse pieces of information identified in the report for purely practical reasons, the short list of indicators identified in the Appendix is based on the template described in Chapter Four of the report and represents the minimally necessary quantitative information for judging national capabilities in the postindustrial age.