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# Thinking about War and Peace: Andrew Marshall and the Early Development of the Intellectual Foundations for Net Assessment

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*This article discusses some of the background and early intellectual influences of Andrew Marshall and the development of the net assessment framework. In particular, it focuses on some of the intellectual foundations for net assessment, key characteristics, and how the style, vision, and ideas of Andrew Marshall have been and continue to be influential for performing net assessment. While focusing mostly on the intellectual/biographical aspects of Marshall's ideas and thoughts, the topic demonstrates significant scholarly implications for current and future strategists, such as the significance of interdisciplinary research for strategic thinking (such as that conducted by the RAND Corporation in the 1950s and 1960s) and the importance of diagnosis in strategy.*

## Introduction

Thinking about strategy, war, and peace goes back to the earliest of times, but thinking about those issues in quite abstract and intellectual ways became, especially after the Second World War, something that was seen as essential. Warfare is not just about technology or weapons, but also how we thought about conflict and wars, and how we conceptualized and understood the strategic competition. Winning the next war and being ahead in military competition became increasingly about being ahead in *intellectual* ways. Strategists needed to spend time not just thinking about war and peace, but also thinking the unthinkable: strategies for staying ahead of potential opponents, how to conceptualize the Cold War competition in mathematical and game theoretical terms, and many other things. One of the most important of these strategists is Andrew Marshall, who arrived at RAND (the Cold War think tank) following his studies of economics at the University of Chicago. He later went to Washington, DC, to set up an Office of Net Assessment (first housed in the White House, then at the Pentagon). He became the first (and only) director of the office in 1972 and remains in that position today.<sup>1</sup>

A history of how exactly net assessment has influenced strategic thinking and topics in strategy, such as the revolution in military affairs (RMA) in the last decades, has yet to be written; and that is *not* the aim of this article. My only suggestion is that such a history needs to include, if not begin from, Marshall's thoughts and work.<sup>2</sup> An understanding of net assessment without Marshall is not necessarily wrong, but something significant would be missing (almost like Hamlet without the prince). Net assessment is a framework for

I am grateful to Joan Goldhamer, Andrew Marshall, James March, Sidney Winter, and Barry Watts for their fruitful comments on earlier drafts and/or discussions of the topic of this article. They all suffered from my repeated questions, emails, and calls with elegant patience. I am in particularly grateful to Andrew Marshall for his time answering my many questions over the years.

thinking about strategic issues, developed in response to many forces and movements and ideas, including institutional, personal, intellectual, and bureaucratic changes. Yet the core ideas in Marshall's work shaped and developed this approach.

As evidenced by his unusual career and interdisciplinary interests, Marshall is a man who clearly does not fit into any standard boxes of intellectual, scholarly, political, or academic inquiry. Neither a pure theorist nor an empiricist as those terms are often used, Marshall is both in some measure, just as he also can think like an economist and a statistician or an anthropologist or a psychologist without fitting any of those categories very neatly. The dynamic character of Marshall's mind can at least in part be traced to the two sides of his interest. On the one hand, he is a deep intellectual and academic mind, interested in a wide variety of theories and ideas, including mathematics, philosophy, game theory, biomedical research, organization theory, history, evolutionary biology, and cultural anthropology. On the other hand, those ideas should correspond with the real world and are powerful precisely because they can, in combination, be used to understand the empirical realities of the world. Another person might have handled the possible tension between admiration for theory and the need for the empirical by compartmentalization, but Marshall developed a framework around net assessment and managed to channel the tension into an unusual but productive and useful framework for understanding strategic issues. Doing this kind of work requires hard intellectual work.<sup>3</sup> "Take six months. Read everything," and "why don't you go out and do some research for a change" are often heard comments of Marshall to people doing analysis and research for him.<sup>4</sup>

Strategic questions such as "How do we think about wars, prevent unnecessary future warfare, keep enemies away?" are all very practical problems, but in Marshall's mind, if we have an intellectual structure for what we do and how we think on such strategic issues, we will be in a better position to understand (and act on) our competitive strengths and weaknesses. His focus is not so much on what might be the policy implications of his work and ideas (he eschews prescriptive and policy work in favor of diagnostic analysis). Instead he wants to provide an intellectual and interdisciplinary framework for understanding the nature and dynamics of strategic competition, now and in the future.

In the rest of this article, I discuss aspects of what constituted the formation of Marshall's ideas, and the early vision and underlying intellectual foundations for net assessment, focusing mostly on the years leading up to the early 1970s.<sup>5</sup>

## **Andrew Marshall: Intellectual Formation**

Marshall was born on September 13, 1921, in Detroit, Michigan, the oldest of two children born to John Pollack Mitchell Marshall and Katherine Marshall (both from the United Kingdom). He grew up in Detroit, always enjoying school and reading in the public library, and as soon as he earned any money he began buying books on his own on topics such as chess, history, science, mathematics, warfare, and strategy. Reading and self-educating became a strong part of Marshall's intellectual growth.

Marshall graduated from high school shortly before the outbreak of World War II. Before going to university, he worked at the Murray Body Company, during which time he found out that he had a minor heart problem that kept him from going to war (despite his eagerness to serve). Marshall took the exams for enrolling in the University of Chicago, which advanced him straight to graduate school to study economics and statistics.

Already at this time, Marshall's interests had crossed traditional disciplinary boundaries. Although his focus of study was economics and statistics, he was interested also in

mathematics, physics, astronomy, philosophy, history, and literature.<sup>6</sup> He did not discuss the content and ideas with any of his contemporaries (although he did find kindred spirits in Herman Kahn and others once he went to RAND).

Marshall's early intellectual curiosity might have also led him to possess an interest in *questions*, rather than *answers*, something that later became an important part of his own mentoring style and a way of thinking as well as a key characteristic of net assessment. While most of the world (certainly in academics and business and politics) focused on providing answers to blurry questions that they may hardly know themselves, leading to recommendations, Marshall thought otherwise: "to me it seemed kind of obvious that diagnosing and framing problems and really understanding them was really important."<sup>7</sup> Thus, one of the key characteristics of the framework he would later develop for strategic thinking is that it is *diagnostic*. He has mentored many strategic thinkers, but never tried to impose his views or perspective or writings. He is teaching people *how* to think, not *what* to think.

The decision to study economics arose partly as a result of Marshall's interest in mathematics, but he did not think it was plausible that one could make a decent living with a mathematics degree, so economics seemed to be close enough to sustain his interest (Chicago did not yet have a statistics degree at that time). His teachers at the University of Chicago included Frank Knight, Milton Friedman, Jimmy Savage, and Rudolph Carnap.<sup>8</sup> Although most of the economists at the University of Chicago had neoclassical economics and rational-choice perspectives, Marshall was already aware then of the *limitations* of rational choice. His awareness of the limitations to human rationality was furthered by Frank Knight, whose teachings and writings covered issues such as the limitations of rationality and of economic theory. He also recalls Herbert Simon (who is often seen as the father of the bounded-rationality approach in economics) presenting some of his early work during seminars at the Cowles Commission, which Marshall attended with great interest. His studies with Carnap also helped provide him a strong and coherent philosophical position upon which to build his framework for understanding strategic behavior, the nature of logic, and the uses of mathematics.<sup>9</sup>

Like most others, Marshall's thinking was shaped by more than a single subculture. The values he acquired early on stayed with him; the academic fields which he entered at the University of Chicago shaped his outlook on theories and the need for a relevant, more empirical approach. None of these subcultures offered exposure to strategic problems and associated intellectual challenges. When he arrived at RAND, he plunged into unfamiliar waters. Values and insights about behavior stemming from his background before RAND proved important to development of net assessment as an *empirically based, interdisciplinary, and diagnostic approach*.

## **RAND and the Importance of Interdisciplinary Research**

For centrality to the postwar quantitative social sciences, the Cowles Commission and the RAND Corporation were definitely the places to see and to be seen.

– Herbert Simon<sup>10</sup>

The ideas and context of RAND were significant for the particular ways in which Marshall came to develop his ideas into net assessment. It was also at RAND that Marshall developed his instinct to balance or shape a deep understanding of military and strategic issues with

an analytical and practical need to also understand them at a conceptual level. During Marshall's tenure there, RAND was one of the few key places that pioneered work of both an interdisciplinary and a problem-driven nature (another place was Carnegie Mellon University).

RAND was created in 1946 as an Army Air Force think tank initially to produce long-term scientific and technical planning for the airmen, as a separate division of Douglas Aircraft Company. However, soon after its reorganization in 1948 into an independent research organization, RAND's work began to assume a much larger role than mere scientific planning for the Air Force and it quickly became an important institution for research on decision making and behavior under conditions of uncertainty. RAND researchers pioneered research across a broad range of social sciences, importing techniques and doing research on systems analysis, game theory, and linear programming, and in many cases established the intellectual bases that continue to underpin the state of knowledge in these fields today. Several departments (numerical analysis, logistics, mathematics, economics) subsequently established at RAND accommodated the growing diversity of scientists, but because of the nature of the problems they were working on, departmental lines did not really matter. It was a working premise that military problems did not conform to disciplinary boundaries and often did not fit a particular academic category very neatly. Instead, once projects started, research projects would migrate through several departments and involve personnel of different skills from many different departments.

John Williams, early spokesman for developing social science at RAND, came up with the idea of organizing a conference specifically designed for social scientists in order to attract the best talents in American (academic) intellectual social science. The conference took place in New York in 1947 and included a broad group including political scientists, sociologists, economists, and mathematicians. The realization that research in social science could have an impact on national security was explicitly stated by Warren Weaver (head of the Applied Mathematics Panel of the National Defense Research Committee during the war, and board member at RAND), in his opening remarks at the conference:

Every piece of knowledge we have in sociology and in economics and in political science, everything we know about social psychology, everything we know about propaganda . . . every piece of information of that sort, I say, is a weapon . . . Since the last war there has been a change in the character of war, a change in the character of the inevitable amalgamation of all the intellectual and material resources of the country which are necessary to maintain our position in peace and to enable us to defend ourselves . . . There have also emerged some patters of working together, particularly among the biological, physical and social sciences, which seem to me to have great promise . . . The whole fields of the social sciences and of the physical sciences must be brought more closely together.<sup>11</sup>

This conference discussed how social science could contribute to issues such as civilian and military policy, the costs of war, psychological warfare, and the economic war potential of the Soviet Union and the United States. Many of the participants at the conference subsequently joined RAND (including Bernard Brodie, Charles Hitch, and Herbert Goldhamer). Others (such as Bernard Berelson) became well known in other interdisciplinary movements. After this conference, and at least in part because of the high degree of intellectual

freedom present, RAND managed to foster Weaver's "working together" of researchers, when disciplinary boundaries would often kept them isolated in an academic context.<sup>12</sup>

### ***Marshall at RAND***

Marshall joined RAND in 1949 (initially in the Washington office in the social science department, then later transferred to the Santa Monica office in the economics department) to work for Herbert Goldhamer on a project on the frequency of mental illness.<sup>13</sup> He went back to Chicago in 1953 but returned to RAND in the spring of 1954 and stayed until he left for Washington in 1971. In the more than two decades Marshall spent at RAND, he translated many ideas into productive intellectual foundations for strategic thought. Although these foundations themselves were interdisciplinary and did not fit the scholarly disciplines, one can clearly see the evolution of Marshall's thought and of the scholarly/intellectual foundations that became important for his framework and practice of net assessment.

At RAND, Marshall was shaped by academic ideas as well as by collaborators and the projects he worked on. Those projects included his discussions with Herman Kahn on human nature; the discussions around The Strategic Objectives Committee, which Marshall joined in 1954 (working with Brodie, Loftus, Hitch and others); the emerging academic work in organization studies and his efforts to create an organizational behavior department at RAND (with James Schlesinger, Richard Nelson, and Sidney Winter); friendship and interaction with another very interdisciplinary spirit, Nathan Leites; and work as the director for strategic studies. These and other projects allowed him to develop his intellectual interests further, apply them to issues of strategy, and to start translating the intellectual foundations and his own vision and experiences and ideas into the development of a framework of net assessment.

### **Intellectual Foundations for Net Assessment: Organizations, Strategy, and Human Nature**

Three of the most significant perspectives Marshall worked on at RAND that also became the intellectual foundations for net assessment are organizational behavior research, research on (business) strategy, and the evolutionary and cultural views of human nature.

#### ***Organizational Behavior and Limited Rationality***

In the context of the intelligence estimating problem, the hope is to replace the current rational process model with something better, something that reflects more accurately the context and the constraints within which Soviet military posture incrementally evolves, as the result of a sequence of decisions over many years.<sup>14</sup>

Marshall's interest in organizational behavior was especially shaped by two things: his interaction with another RAND researcher, Joseph Loftus, and the emerging academic research program in organizational behavior. Loftus joined RAND in 1954 after working as a civilian analyst for the Air Force. They met during the discussions of the project on The Next Ten Years, which asked a set of hard questions regarding Soviet nuclear systems and U.S. strategic positioning, among other issues. The report did not recommend a clear

or precise strategy (in keeping with insight that questions are more important than answers) and was broad in scope (issues ranging from NATO to deterrence to counterforce), and emphasizing also the importance of facts for diagnosis.<sup>15</sup> While working on this, Loftus and Marshall started talking about (Loftus's) experiences with the Soviet nuclear program and the importance of understanding real Soviet behavior and interpreting the Soviet systems of organizations, with limited rational behaviors, rather than rational decision makers fitting within a disciplinary model. Both battled with the RAND political scientists working on interpreting Soviet military doctrine: "[T]hey absolutely refused, as far as we could tell, to look at what the Soviets actually did," Marshall recalled.<sup>16</sup>

The unhappiness with the unrealistic empirical assumptions of the theories and perspectives used to understand the world in terms of full rationality occurred outside RAND. The idea of boundedly rational decision making in organizations was an important foundation stone for the research program that emerged from the Carnegie School of Behavioral Economics (Simon, Cyert, and March in particular), which Marshall discovered and built on since he first started reading the works of these theorists while at RAND.<sup>17</sup> Their work developed the ideas of bounded rationality and implications for organizational behavior, building on insights from studies of organizations in political science, sociology, economics, and social psychology, and introducing concepts (such as the idea of conflicting goals within organizations), which Marshall used and applied to understanding the strategic competition with limited rationality and thus to help us obtain a better understanding of Soviet behavior.

Marshall's article "Improving Intelligence Estimates through the Study of Organizational Behavior," published in 1968, most clearly puts organizations and limited rationality in the center of analysis. Written as a presentation to the Board of Trustees at the RAND Corporation, the article makes a strong plea for the use of organizational behavior insights and ideas when studying intelligence issues. It also puts special emphasis on the need for a conception of human nature that uses models of bounded rationality. It argues that by replacing the rational model with models of limited rationality, we can gain better estimates of Soviet military posture when looking to the future.<sup>18</sup> Marshall used these ideas to advance the understanding of Soviet behavior and to draw implications for understanding the dynamics of the strategic competition. Thus, over the years, he felt able to provide a more sustained attention to the problems of strategy by analyzing organizational ideas.

Already at the time of the work with Loftus, Marshall was so convinced of the promise of organization theory that he led an effort at RAND to set up a more organized unit for the study of organizational behavior.<sup>19</sup> He and Sidney Winter discussed the significance for such a program area for RAND, and how it would specifically have the behavioral perspectives on decision making and limited rationality as a starting point.<sup>20</sup> James Schlesinger (who had started at RAND as Marshall's research assistant) and Richard Nelson were also involved in these efforts.

As a result, Marshall proposed a program that would help develop the tools for understanding, predicting, and improving organizational decision making that explicitly focused on the Carnegie school's ideas. The intent was to begin a long-term project, carefully researching all the existing contributions to organizational behavior, and to extend and adapt the ones suitable to understanding military organizations. While this department did not really take off as a separate research department at RAND (in part because Marshall left RAND for Washington, DC a few years later), Marshall's thoughts on this area continued.

### ***Extending the Understanding of Organizations to Strategy***

Building on his work on organizational behavior, Marshall found a second intellectual foundation for the framework he was developing: the field of business strategy. When Marshall was researching the field of organizational behavior, he was also led to the early work of Joseph Bower and C. Roland Christensen on *strategies* of business organizations. Marshall invited them, together with Jim March and Graham Allison, to work on a study at RAND.<sup>21</sup>

At the time Marshall first became interested in those ideas, much of the research in the field of business strategy was conducted at Harvard. Like organization theory, business strategy emerged in part in reaction to the static analysis in neoclassical economics and the inability within one single discipline to develop empirically valid understandings about the behavior of firms and their strategic decision making and other aspects such as entrepreneurship, innovation, tacit knowledge, and the nature of competitive advantages.

Academically, the field of business strategy is in many ways a natural extension of the organization theory field. The two areas are often considered the “core areas” in business school research and teaching. However, it was before those areas became well developed in the scholarly domain that the issues of organizations and how they pursue strategies were connected in Marshall’s mind. As he noted: “[F]or me it was an extension to my interest in organizational behavior. I was interested in what was coming out of the business school relating to understanding organizations, and the strategies that organizations have.”<sup>22</sup>

Thus, both organizational behavior and strategy ideas were important intellectual foundations for an article Marshall wrote, which intellectually was the precursor for net assessment framework. Written between 1969 and 1970 (published as working paper in 1972), the paper was titled “Long Term Competition with the Soviets: A Framework for Strategic Analysis.”<sup>23</sup> The paper considers the competition with the Soviet Union: how to understand its nature, how to understand them (the Soviet leaders), and the strategic implications of understanding long-term arms competition for the United States. Given the existing and continuing strategic arms competition with the Soviet Union, Marshall developed a framework for assessing the nature of the strategic competition, clarifying the goals of the United States, and developing a strategy for efficient competition. The belief behind this framework and the implied ability to analyze programs to improve the U.S. strategic force posture would have several potential payoffs, including helping to rebut arguments against programs that would focus on strategic stability as the main U.S. goal, providing a basis for developing improved policies for R&D procurement and raising the issue of how well the U.S. was really doing in the competition with the Soviets.

In his discussion of goals, Marshall was clearly inspired by the Cyert and March behavioral discussion of the organization consisting of many, conflicting goals:

Assuming that the United States is in a long, continuing strategic arms competition, what should its strategy be? Until goals are more clearly agreed upon, it is very difficult to say. But clearly there are many goals, and whatever they are, both sides compete within a number of constraints: relatively fixed resources over any short period of time and numerous complications in internal decision making processes that slow and diffuse reactions to the opponent’s moves or to new technological opportunities.<sup>24</sup>



Marshall argued for an interdisciplinary analysis and for using a plurality of methods in the framework, including gaming, research on decision making under uncertainty, organizational behavior, research on decision-making processes, and the implementation of strategy. He was well aware of the potential difficulties: “Developing and gaining acceptance for a new framework of strategic analysis will not be easy. Changing people’s minds, or ways of thinking about problems, takes time.” Marshall noted that useful outputs from specific studies might be possible within a year, while “full implementation of this framework of analysis, as a practical way of planning and programming U.S. strategic forces, would require changes in analytical and other techniques [which] would undoubtedly take several years.”<sup>25</sup>

A major idea in the paper is the importance of relative strengths and weaknesses. Strengths and weaknesses are ambiguous concepts, and focusing only on the “threat” aspect of opponents and their apparent strengths neglects the importance of the possibility of exploitation of weaknesses. At the heart of such weakness is limited rationality on their part and on ours, for if the Soviet planners were fully rational, they would leave no weaknesses open to exploit. On the other hand, if the United States was fully rational as an organization in the sense that Simon and March argued against (assuming clear and well-known preferences and perfect knowledge), it would imply already knowing all alternatives and access to all information, which would be reflected in current action. But in the presence of limited knowledge and rationality, it becomes important to know the particular histories and constraints of organizations. As Marshall stated, “We fail to take Soviet constraints into account in our planning . . . The Soviets, as ourselves, are constrained by inherited doctrines, forces, and notions.”<sup>26</sup>

But understanding the opponent is not only about acknowledging his limited rationality and his weaknesses. If we understand decision making and world perceptions, we might be able to use that information to make certain decisions or moves on the U.S. part that lead to a greater disadvantage for the opponent. *Human nature, and understanding human nature, becomes, in itself, part of strategy.*

### ***Evolutionary and Cultural Perspectives on Human Nature***

Nothing is more fundamental in setting our research agenda and informing our research methods than our view of the nature of the human beings whose behavior we are studying.

– Herbert Simon<sup>27</sup>

The third intellectual foundation for net assessment, the evolutionary and cultural nature of behavior and its importance to strategy, was present in Marshall’s mind already at RAND (even before he had read works by Darwin, which made him interested in the general theories and ideas of evolution). Thus, he extended his interest in organizational behavior and organizational strategy to also include evolutionary and biological and psycho-cultural approaches to behavior. This also enabled him to better understand other phenomena, such as the biological basis for certain behaviors, the influences of psycho-cultural aspects on political decision making, and the behavior of men in groups—things that were consistent with the empirical facts of the world, but not very well understood (certainly not by narrow economics- or political science–based theories).

Important to Marshall’s views on human nature was his friendship with Herman Kahn (and later Nathan Leites). In the early 1950s, Marshall and Kahn discussed the need for

a more realistic framework for understanding human behavior—one that crosses some very fundamental boundaries. Kahn, like Marshall, was an avid reader, and the two for many years spent almost every night and weekends together save for the time they were traveling. Their professional areas differed quite a bit. Kahn was interested in bomb design, but they worked together on Monte Carlo simulations of one of the designs of an early thermonuclear device. They would go to the library and read books by Margareth Mead and early anthropology work on culture, and talk about stories on the more colorful aspects of human nature. Not only did they find that human behavior matters, but the contexts in which people operate (often organizations) also matter. (Kahn had been in the Army Signal Corps and was on the Burma Road and some of his observations drew from that experience.) Human nature is constrained, embedded, and enabled by organizations and other institutional structures, but there are also certain evolutionary and cultural aspects of human nature that may provide insight into behavior. Thus, the third theme that I see as the major intellectual foundation for net assessment (in Marshall's framework) derives from the views on human nature.

Marshall became increasingly interested in gaining a deeper understanding of the evolutionary roots of human nature, beyond what was found in the concept of limited rationality. Both he and Schlesinger read some of the works of Robert Ardrey, Konrad Lorenz, Lionel Tiger, and Robin Fox.<sup>28</sup> Marshall believed that in defense and security, decision makers and organizations are influenced by their evolutionary nature. They are also shaped by the culture in which they find themselves. Marshall discussed this insight especially with Leites, who worked on developing various psychocultural and psycho-analytic understandings of decision making.<sup>29</sup>

A central theme in the work by Tiger, Fox, and others is that people are not simply driven and motivated by factors such as utility or other quantifiable aspects. In addition, there are certain deep, instinctual, and essentially *biological* components to human behavior. Thus, understanding these components and how they interact with social elements (such as groups and cultures) become important. For example, in *The Imperial Animal*, Tiger and Fox discuss how humans have a universal “biogrammar,” which programs our basic behavior. The idea of studying such instinctual components is motivated, at least in part, by the belief that they constitute some of the most basic—and persistent—elements in human behavior.

The evolutionary anthropologists share with Simon, Cyert, and March the belief that one needs to analyze beyond determining whether an action is rational in the neoclassical sense: “The economists ‘rational man’ was an oversimplification,” Tiger wrote; “How economic decisions [is] made . . . [is] much more complex than the current theoretical models.”<sup>30</sup> The evolutionary anthropologists advocated the crossing of disciplinary boundaries not only between the different social sciences (as the behavioralists argued), but also between the social and biological/natural sciences. And Nathan Leites's work added a perspective that crossed not just disciplinary boundaries, but cultural ones, too, all steps toward an even more realistic interdisciplinary/cross-cultural understanding.

Marshall thus recognized that a full understanding of real-world phenomena (such as people, wars, and cultures) required several disciplinary perspectives. Many of the insights regarding the influence of cultures and religion and behavior in groups relevant to strategy also today come from the work of evolutionary anthropologists. Major themes include the influence of groups; factors like male bonding; influence of the difference between male and female on behavior and other biological and instinctual elements that influence how people process information; why we chose to bond with some, and not others; why men tend to form groups and women do not; why and how we pursue pleasure and the influence of optimism on behavior; and why and how culture and religion matter. Tracing these themes

to the most fundamental level: we behave culturally and are influenced by groups and social norms and religions because doing so is, simply, “in our nature.” The evolutionary perspectives on human behavior therefore became another important foundation for net assessment.

## **Net Assessment as Interdisciplinary, Empirically Driven, and Diagnostic Framework**

In the early 1970s . . . efforts led to the creation of the *discipline* of net assessment that has been used in the Department of Defense ever since.<sup>31</sup>

Net Assessment is a form of descriptive *analysis*, in contrast to cost-effectiveness analysis, which is largely normative or prescriptive.

Net Assessment has been vaguely defined since the *concept* was established several decades ago.

Net assessment . . . [is] a search for broad insights.<sup>32</sup>

### ***Definition(s)***

In perhaps the best published article written about the nature of net assessment, the concept is defined as a discipline; an analysis; a concept and a search for insights; and, perhaps, most importantly, as “a way of thinking that should be broadly pursued.”<sup>33</sup> This illustrates, perhaps, both the generality and concreteness of net assessment, a framework with its own concepts and methods and ideas in the spirit of Whitehead’s observation that “[e]very science must devise its own instruments.”<sup>34</sup> While it may not be possible to provide a narrow definition of net assessment, we might instead try to characterize the term by other dimensions, thus highlighting some key characteristics of net assessment and drawing parallels to other ideas and traditions, which Marshall’s thinking integrates and elaborates. Just as net assessment can be interpreted as a framework, a way of thinking, and a problem-driven and interdisciplinary practice, it relies on evidence, theory, logic, judgment, and beliefs. Thus, it crosses other methodological and philosophical boundaries in addition to the disciplinary ones. But it is precisely such a genuine broad and embracing approach that is needed to understand real-world, complex phenomena (such as warfare or particular behavioral patterns of humans), which are ultimately about human behavior. As Marshall embraced a number of ideas from many corners of the academic, and military, and national security worlds in creating net assessment, the framework of net assessment became open, but at the same time comprehensive; a frame of reference which has aspects of theory, paradigm, concept and can be seen as an intellectual tool deeper than merely an analytic tool box.

The framework and the conceptual approach of net assessment is closely integrated with Marshall’s vision and early work, in particular with some aspects of his work at RAND (outlined above). In one sense, it can be interpreted as building directly upon the intellectual foundations and having grown out of the “long-term competition” framework which Marshall first formulated in 1969, as well as a few other early papers, in particular his 1968 paper “Improving Intelligence Estimates through the Study of Organizational Behavior.” As the ideas and Marshall co-evolved, net assessment became a way of thinking,

and also a practice, thus, at the same time very scientific, analytical, and conceptual, but also very empirical in the sense of driven by real problems and evidence. As Marshall recalled in a recent interview:

I gradually was thinking about it and decided that [Net Assessment] was not only feasible, but it was also (particularly when I got over here to the Pentagon), the *appropriate* thing to do: to apply this long term competition framework and to focus it in ways to provide insights for Schlesinger and other top level people here.<sup>35</sup>

### ***Characteristics***

The framework of net assessment thus reflects Marshall's interdisciplinary and problem-driven worldview, which intends to provide diagnostic assessment of potential use for defense strategists. These characteristics derive from Marshall's view that issues of strategic thinking are matters that could be understood not through disciplinary, but through interdisciplinary, thinking; needing empirical as well as theoretical research and hard intellectual work; having an intellectual framework, but being driven by empirical problems; and requiring analysis using multiple tools and methodologies.<sup>36</sup> In addition, most (if not all) analysis in this framework would have to be fundamentally diagnostic, because prescriptive analysis or policy orientation would bias the research and distort objectivity.<sup>37</sup>

### ***Net Assessment as an Interdisciplinary Framework***

Because of Marshall's unusual ability to combine often very different views and perspectives and his deep academic mind, his interests and readings are significantly more cross disciplinary and cross fields than most (if not all) academics. If a list of his readings and interests had to be categorized by discipline, the fields would include (at least): economics, statistics, political science, history, philosophy, sociology, organization theory, management theory, military studies, operations research, decision theory, psychology, mathematics, and several others. The term "diverse" does not even begin to describe his intellectual interests; and it is in this truly interdisciplinary mindset that we find a key to his early conceptions of (and later elaborations of) the idea of net assessment. Marshall's ability to cross disciplinary fields and his strong intellectual curiosity also has implications for the views of human nature that Marshall formed and found relevant to net assessment work. Interdisciplinarity is thus one key characteristic of net assessment.

### ***Net Assessment as a Problem-Driven Framework***

Another related dimension of Marshall's visions and work lies in the idea of problem-driven research: the interest in, and ability to use, elements of ideas from many different disciplines to understand a particular problem. Thus, the way we frame, write about, think about, and draw implications about a particular problem is essentially empirically motivated. This integration of reality with theories and ideas is rather unique (most people, scholars, and other intellectual minds seem most comfortable choosing one view over the other, rather than an integration); and seeing net assessment as being problem-driven research sets it apart from traditionally academic work (which applies certain theories to empirical problems, rather than letting the nature of the problems determine which theories to use), as well as pure empirical work. In that sense, Marshall's ability to link together empirically relevant

problems with aspects of theories and ideas necessary to frame those problems is similar in many ways to Simon's perspective.<sup>38</sup> Moreover, in keeping with Simon's perspective, "empirically based" does not mean anti-analytical. On the contrary, net assessment has very solid scholarly interdisciplinary foundations, and as a framework gives a perspective through which one can understand particular empirical challenges, such as the ones posed by RMA, which Marshall saw not to be just about technology, but also as an intellectual and information-based revolution. Hence, he changed the vocabulary, he went from the earlier "military technical revolution" to "revolution in military affairs" (also reflecting a conscious awareness that the words and concepts we use profoundly shape how we think).<sup>39</sup>

### ***Net Assessment as a Diagnostic Approach***

A third important characteristic of net assessment in Marshall's mind was the emphasis on diagnosis, and thus, the intention of net assessment as a diagnostic tool/framework/concept/practice. In several fields and practices, there is often a possible tension between diagnostic and prescriptive analysis and research, and the pressure for policy recommendations. According to Marshall, diagnosis is to be preferred because, for one thing, prescription often tends to "corrupt the analysis," because a focus on intended policy results may blur objectivity. As he observed: "if you have people making prescriptions . . . it is going to bias the analysis. People psychologically favor certain policies and then distort the analysis. In order to get [an] even handed, objective approach you [need] to . . . constrain it to the diagnosis problem."<sup>40</sup> Marshall built this emphasis into his formulation of net assessment:

Our notion of a net assessment is that it is a careful comparison of U.S. weapon systems, forces and policies in relation to those of other countries. It is comprehensive, including description of the forces, operational doctrines and practices, training regime, logistics, known or conjectured effectiveness in various environments, design practices and their effect on equipment costs and performance, and procurement practices and their influence on costs and lead times. The use of net assessment is intended to be diagnostic. It will highlight efficiency and inefficiency in the way we and others do things, and areas of comparative advantage with respect to our rivals. It is not intended to provide recommendation as to force levels or force structures as an output.<sup>41</sup>

While net assessment evolved from a concept or a framework to become also a practice over the last decades, the basic insights, intention, and approach have remained the same, and Marshall continued to refine and develop the basic ideas as well as to apply those ideas to specific developments. Regardless of what recent, current, and future work will be done to apply, elaborate, or refocus net assessment for the future, the intellectual foundations and the key characteristics remain important. Current issues that might benefit from net assessment thinking include: understanding how the Chinese make decisions (including the cultural influences and the differences in how they see things from us); understanding the implications of the Chinese revolution in military affairs; understanding Chinese defense economics (and the differences in how they measure things) and the strengths and weaknesses in their organizations; understanding the links between organizational structures and decision-making hierarchy in network-based organizations (such as those terror

organizations often use); and understanding how global economic and social changes affect our strategic capabilities and position and potential future conflicts.<sup>42</sup>

## Closing

The importance of long-term strategic thinking and the growing awareness of topic such as the RMA, and thinking about how human nature influences conflict and war, recently gained attention.<sup>43</sup> These and other contributors have hinted at the importance of net assessment and the thinking and works of Andrew Marshall. The development of the net assessment framework did not come overnight and one can observe the evolution of an increasingly dynamic view of the world and of human nature in Marshall's writing. His education in economics and statistics expanded to include organizational and budgetary constraints, and cognitive and computational limitations to human rationality. Later, he was influenced by perceptions, groups, cultures, and beliefs, as well as other very subjective and embedded factors.

It is essential to net assessment thinking that it is *interdisciplinary* by nature. Another key idea is the emphasis on diagnosis, not policy, providing detailed descriptions and understandings of certain central issues. For academically trained disciplinary minds as well as for policy people, this emphasis may be a hard thing to understand. To economists (and most other single-minded disciplines), interdisciplinarity often seems like an unnecessary empirical program that depends on large amounts of data. For Marshall, the intellectual advantages of his very open-minded, interdisciplinary, and diagnostic conception of net assessment seems obvious. Any other conception would necessarily contain the seeds of its own destruction; there would necessarily be issues or problems or opportunities that, if overlooked, might lead to military disadvantages. "It just seemed so obvious," he said, "I mean, what other ways [are there] to think about the issues . . . [and] to provide analysis and information for decision makers such as the Secretary [of Defense]."<sup>44</sup>

During recent decades when Marshall developed the framework of net assessment, it has been quite influential for some core approaches to strategy, although often in a very implicit or embedded way (consistent with Marshall's mentoring style and not telling people what to do). For example, Marshall's ideas on net assessment are an essential component in the RMA. He has influenced numerous scholars such as Steven Rosen, Mike Pillsbury, Barry Watts, Andrew Krepinevich, Wick Murrey, Aaron Friedberg, and many others by shaping their views on strategy.

The net assessment framework is still developing. As an analytic framework, it offers an interdisciplinary and integrative perspective in which many disciplines and ideas are used as tools for understanding the dynamics of strategic competition. Understanding and utilizing ideas from different traditions—organizational behavior, limited rationality, strategy, capabilities, and the evolutionary nature(s) of humans—provides a unique intellectual platform for net assessment.

The future relevance of net assessment for strategy will depend at least in part upon current and future scholars and practitioners who follow Marshall's quest to develop an empirically relevant framework that accommodates and addresses many issues relating to the dynamics of the competition (not just a policy angle or a narrower view) and his unique ability to see value in works that are beyond any narrow conception of what may appear, at first sight, relevant (in the sense of fitting a narrow policy or agenda or contemporary issue), and/or fitting within any one person's intellectual perspective.

## Notes

1. The Office of Net Assessment is rooted in earlier *institutional* efforts to establish a net assessment group within the National Security Council (NSC) (that had in fact existed in the 1950s and 1960s). The *intellectual* content of the work Marshall began he developed earlier. An *integration* of the intellectual and institutional forces came when Marshall began working for Henry Kissinger on studies of intelligence, and through President Nixon's efforts to reorganize the intelligence community and create a net assessment group again in NSC. The Office of Net Assessment was created in January 1972, but Marshall became a full-time government employee in April 1972. His work and execution of his vision for net assessment, which he had build in the decades earlier, really began when James Schlesinger, who Marshall worked with at RAND, became the Secretary of Defense in July of 1973, and Marshall moved from the White House to the Pentagon that October to be the Director of Net Assessment.

2. Many papers discuss Marshall's role in the discussion of strategic topics, such as how we can (and can't) learn from past wars and conflicts, and the influence of net assessment in the RMA. See, e.g., T. Mahnken and B. Watts, "What the Gulf War Can (and Cannot) Tell Us about the Future of Warfare," *International Security*, vol. 22 (Autumn 1997): 151–162; and S. P. Rosen, "The Impact of the Office of Net Assessment on the American Military and the Matter of the Revolution in Military Affairs," *Journal of Strategic Studies*, vol. 33, no. 4: 469–482. This article is intended to supplement these accounts, not as a correction.

3. As he noted in a document on The Nature and Scope of Net Assessment, "The single most productive resource that can be brought to bear in making net assessments is sustained hard intellectual effort." National Security Council (NSC) memorandum, August 16, 1972, (Secret, declassified in 2002), 2.

4. This style and the way he works is partly a matter of personal style and partly a conscious decision, too, because it encourages creative thinking about a particular problem, or a particular structure, or (as is sometimes the case in the office work), a particular balance. But at least as important, this also reflects Marshall's deep belief that how we think about, and frame, strategic problems (in defense as in other matters), is more important than searching for solutions (resulting, for instance, in the emphasis on net assessment as a diagnostic tool). "Questions are usually more interesting than answers," he often says.

5. I am not implying that the years after the 1970s are not important. This article focuses on the intellectual roots that led to the development of the framework of thinking that Marshall envisioned in the early days of the office.

6. Marshall read works by Alfred Whitehead, Bertrand Russell, M. Ayers, and George Santayana as a teenager. Other books that had a big influence early on were Toynbee's work, on *A Study of History* (which gave Marshall an early interest in the influence of cultures and societies, history, and the structure of systems) and Ford Madox Ford's *The March of Literature*. The latter led Marshall to read Russian writers such as Dostoyevsky and Tolstoy.

7. Personal conversation/interview with Andrew Marshall.

8. One of the more interesting aspects of the University of Chicago Economics Department at the time was that it was hosting the Cowles Commission. This Commission championed the use of mathematics, statistics, and economic theory to develop new ideas for economics and to solve complex problems of planning and management. Cowles scholars saw themselves as using high-level theoretical and statistical tools to clarify issues of management. It included scholars such as Kenneth Arrow, Jacob Marschak, John Harsanyi, Herbert Simon, Martin Shubik, and Tjalling Koopmans, among others, and they held regular meetings to discuss their research, which Marshall participated in with interest (many of these scholars would also later come to RAND).

9. Marshall's dissertation references Carnap in a discussion of what is an econometric model (see Andrew W. Marshall, *A Test of Klein's Model III for Changes of Structure*, Department of Economics, University of Chicago, 1949, 3). Marshall did not become as radical an empiricist or so enamored of formalization as Carnap. Interestingly, he shared with another Chicago student, Herbert Simon, the interest in economics and the limitations of rationality, and teachers such as Knight and

Carnap. And while the paths of the two diverged after Chicago (with Simon going to Berkeley, then on to Carnegie to establish a research program in limited rationality), Marshall developed his framework in quite similar interdisciplinary and empirically relevant ways as Simon. They also both spent time at RAND, although Marshall much more than Simon.

10. Herbert A. Simon, *Models of My Life* (Cambridge, MA: MIT Press, 1991), 116.

11. Warren Weaver, "Opening Remarks," in *Prospectus, Conference of Social Scientists*, RAND Archives, Conference on Social Sciences, Box 2.

12. Another partly overlapping example of a successful interdisciplinary research environment was the Graduate School of Industrial Administration at Carnegie Mellon University, which would have a significant influence on certain developments within management education and business schools (Mie Augier and James G. March), *The Roots, Rituals, and Rhetorics of Change* (Stanford, CT: Stanford University Press, 2011).

13. Some of their work was published as H. Goldmaner and A. Marshall, *Psychosis and Civilization* (Clencoe, Illinois: The Free Press, 1949).

14. Andrew W. Marshall, "Improving Intelligence Estimates through the Study of Organizational Behavior," paper presented to the RAND Board of Trustees, March 15, 1968, page 2.

15. B. Brodie et al., "The Next Ten Years," RAND D-2700, 1954. The authors of this article were known as the "Strategic Objectives Committee," which had begun with a series of meetings that Charles Hitch had initiated at RAND to think through the larger strategic issues for the future. It was also intended to help facilitate interdisciplinary communication at RAND and thus further break down the boundaries between the hard and the soft sciences, and to examine how the social sciences could contribute to strategic issues.

16. Marshall and Loftus also wrote several others articles together. Several of these are still classified and, as of this writing, there is not yet a complete list of the writings of Loftus and Marshall. Their work included: J. Loftus and A. Marshall, "RAND Research on the Soviet Military," D-4943-PR (1958); and J. Loftus and A. Marshall, "Forecasting Soviet Force Structure: The Importance of Bureaucratic and Budgetary Constraints." RAND RM-3612-PR (1963).

17. The most well known works include: H. A. Simon, *Administrative Behavior* (New York: Free Press, 1947); J. G. March and H. Simon, *Organizations* (New York: Wiley, 1958); and R. Cyert and J. March, *The Behavioral Theory of the Firm* (Englewood Cliffs: Prentice Hall, 1963); H. A. Simon, "A Behavioral Model of Rational Choice," *Quarterly Journal of Economics*, vol. 69 (1955): 99–118; and J. G., "March, Bounded Rationality, Ambiguity, and the Engineering of Choice," *Bell Journal of Economics*, vol. 9 (1978): 587–608.

18. At this time, Marshall also developed his thoughts on limited rationality and organizational behavior into conceptions of what models one might use to understand issues of conflict. He wrote a paper on "The Role of Organizational Process Models in Strategic Analysis" (Marshall, 1969). Another one written with Graham Allison titled "Explanation and Prediction of Governmental Action: An Organizational Process Model" (Andrew Marshall and Graham Allison, "Explanation and Prediction of Government Action: An Organizational Process Model," RAND paper, 1969), predated and anticipated the themes of Allison's later famous book resulting from his being rapporteur on some of Marshall's seminars.

19. He recruited several people to work with him, including Jim March, Pat Crecine, Graham Allison, and others, and also went to Harvard to talk with Richard Neustadt about these issues. Neustadt suggested they establish a group of people to discuss these issues. He formally organized the group of scholars to meet for seminars.

20. A. W. Marshall and S. Winter, "Memorandum to Rowen, A RAND Department of 'Management Science'—the Case in Brief," December 29, 1967, memo no. 8668, 1.

21. Part of this work involved a report that the intelligence community requested of Marshall. The result was classified in the report by Marshall et al., titled "Organizational Behavior of the Soviet Military Bureaucracy," August, 1968 Secret.

22. Personal interview with Andrew Marshall, 2008.

23. Andrew W. Marshall, "Long-Term Competition with the Soviets: A Framework for Strategic Analysis," RAND R-862-PR, 1972. Written while Marshall was the director of strategic studies at



RAND, the paper was intended to provide a framework for the future directions of RAND's research on U.S.-Soviet behavior, and specifically to argue for the need for a long-term perspective.

24. Marshall, "Long-Term Competition with the Soviets," vii.

25. Marshall, "Long-Term Competition with the Soviets," 2.

26. The ideas from the field of business strategy and their potential use in net assessment also became particularly important in his work with James G. Roche (a former Harvard Business School student) when they examined the potential of some of the business strategy ideas for defense strategic planning. In one paper, they combined ideas on organizations with ideas from business strategy, and discussed the need for a long-term framework for thinking about the competition with the Soviets. Criticizing the focus of defense planners having a horizon of one to five years, they argued that effective competition with the Soviets requires "at least a 10–20 year perspective," because of the longer gestation period for major force investments, in part because the process of diffusion from the technology itself can span several years from the innovation. Thus, a long term perspective is necessary for strategy. A. Marshall and J. J. Roche, "Strategy for Competing with the Soviets in the Military Sector of the Continuing Political-Military Competition," Department of Defense Memorandum, 1976, page 5.

27. Herbert A. Simon, "Human Nature in Politics: The Dialogue of Psychology with Political Science," *The American Political Science Review*, vol. 70, no. 2: 303.

28. There are several labels used for this work, including "the zoological perspective," "biosocial anthropology," and "biosociology." The major works include R. Ardrey, *The Territorial Imperative: A Personal Inquiry into the Animal Origins of Property and Nations* (New York: Atheneum, 1966); K. Lorenz, *On Aggression* (New York: Harcourt, Brace & World, 1966); Lionel Tiger, *Men in Groups* (New York: Random House, 1969); and Tiger and Robin Fox, *The Imperial Animal* (Toronto: McClelland and Stewart, 1971).

29. For example, see N. Leites, "Psycho-Cultural Hypotheses about Political Acts," *World Politics*, vol. 1, no. 1: 102–119.

30. Lionel Tiger, *Men in Groups*, 16.

31. George E. Pickett, James G. Roche, and Barry D Watts, "Net Assessment: A Historical Review," in Andrew W. Marshall, et al., eds., *On Not Confusing Ourselves: Essays on National Security in Honor of Albert and Roberta Wohlstetter* (Boulder, CO: Westview Press, 1991), 160, emphasis added.

32. Pickett et al., "Net Assessment," 177, 177, 180, emphasis added.

33. Pickett, Roche and Watts, "Net Assessment," 177.

34. A. N. Whitehead, *Science and the Modern World* (New York: Mentor, 1925), 143.

35. Interview with Andrew Marshall, 2008.

36. On the need for many different tools and languages in understanding social science problems, see Herbert A. Simon, "Some Strategic Considerations in the Construction of Social Science Models," in P. Lazarsfeld, ed., *Mathematical Thinking in the Social Sciences* (IL: Free Press, 1954), 388–438.

37. I use the term "framework" rather than "discipline" or "theory" or "methodology" because those latter terms often constrain the understanding of the phenomena, rather than increasing it. Also, theories and methodologies are often associated with a certain disciplinary set of ideas and tools. Thus, using framework instead allows one to essentially free the term net assessment from disciplinary constraints and concepts.

38. My use of the phrases "problem driven," "empirically motivated," and "interdisciplinary" come from the similarities between Marshall's thinking and that of Simon, who was one of the pioneers in interdisciplinary and problem-driven behavioral–social science theorizing. Simon named the subtitle of his last book "empirically grounded economic reason" in part to show his own changing attitudes toward formal economic theory vis-a-vis empirical research and the evolution of his own research agenda (Herbert A. Simon, *Models of Bounded Rationality: Empirically Grounded Economic Reason* [Cambridge: MIT Press, 1997], x–xi). Empirically driven analysis and research is not "theory building" in a narrow sense, but it can still be quite theoretical or conceptual in the sense of using theoretical tools to understand certain issues or data.

39. Andrew Marshall, "Some Thoughts on Military Revolutions," Office of Net Assessment Memorandum, August 23, 1993.

40. Interview with Andrew Marshall. In addition, focusing on prescription may imply a lack of realism in the assumptions underlying net assessment (thus violating the idea of problem-driven and empirically motivated research) because of the flaws in such positivist methodology. This also illustrates some links between the emphasis on diagnostic research, interdisciplinary methods, and empirically motivated research on a more philosophical level.

41. Andrew Marshall, "The Nature and Scope of Net Assessment," 2.

42. See, for example, B. Watts, "The Implications of China's Military and Civil Space Programs," Testimony before the U.S.-China Economic and Security Commission 2011; M. Pillsbury, *China Debates the Future Security Environment* (Washington, DC: NDU Press, 2000); A. Friedberg, "The Strategic Challenge of China," in M. Augier and B. Watts, eds., "Conference Report on the Past, Present and Future of Net Assessment," 2008.

43. See, for example, B. Watts, "The Maturing Revolution in Military Affairs," Center for Strategic and Budgetary Assessment Working Paper, 2011; T. Mahnken and B. Watts, "What the Gulf War Can (and Cannot) Tell us about the Future of Warfare," *International Security*, vol. 22 (Autumn 1997): 151–162; and S. P. Rosen, "The Impact of the Office of Net Assessment on the American Military and the Matter of the Revolution in Military Affairs," *Journal of Strategic Studies*, vol. 33, no. 4: 469–482; and S. Rosen, *War and Human Nature* (Princeton: Princeton University Press, 2007).

44. Personal interview with Andrew Marshall, 2008.

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