Conclusion

The Future of the "Second Nuclear Age"

ICHIMASA Sukeyuki



An unarmed Trident II D5LE missile being launched from USS Wyoming (©U.S. Navy/ZUMA Press Wire Service/ZUMAPRESS.com/Kyodo News Images)

This book addressed from several angles the theme of "new horizons of the nuclear age," with all authors providing insights for the future of the "second nuclear age." It concludes with this chapter summarizing the findings of each chapter and column.

First, this book presented a theoretical model of how strategic stability based on mutual vulnerability can have negative impacts in the present day. In contemporary nuclear rivalries, achieving mutual vulnerability is expected to create leeway for a conventionally inferior revisionist state to intensify its challenge to the status quo at lower levels of the escalation ladder. When weaker revisionists actually intensify its aggressive behaviors, a vicious cycle may arise in which nuclear-armed rivals pursue various options for the limited use of military force, which increase the risk of nuclear use, as well as measures that have direct bearings on strategic stability. On the other hand, the intensification of violence by a conventionally inferior revisionist state, which triggers the cycle, is not necessarily unavoidable. These aggressive actions can be constrained if a status quo power can impose sufficient costs on the revisionist side at similarly low levels of the escalation ladder. Kurita's argument is a deductively derived hypothesis that requires follow-up with empirical research; however, if validated, it would have immense policy implications. Especially given the existing strong concerns about the challenges posed by nuclear-armed revisionists, it would be highly meaningful to provide a theoretical prescription for managing such risks. At the same time, Chapter 1 highlighted the need to further study the modern-day implications of the theoretical propositions of nuclear deterrence theory established during the "first nuclear age," such as strategic stability and the stability-instability paradox.

In terms of recent developments in nuclear deterrence theory, Motoyama's column discussed the debate between the nuclear deterrence school and the nuclear superiority school and how both schools are built upon fundamentally different worldviews. The nuclear superiority school, while inheriting the worldview of the traditional damage limitation school, is noteworthy for developing its own logic using theoretical language shared by nuclear deterrence theory. Motoyama's analysis showed that both schools engaged in a discursive "tug-of-war" in the 2022 Nuclear Posture Review to shape U.S. nuclear strategy in a more desirable direction. While this analysis is made from an academic perspective, the argument that the U.S. nuclear strategy might combine elements from both schools is thought provoking. If the nuclear superiority discourse, which denies the concept of nuclear revolution, gains traction among nuclear-weapon states other than the United States and among nuclear-armed states, it could potentially alter the discussion on strategic stability that relies on mutual assured destruction (MAD) in the "first nuclear age." Fortunately, nuclear weapons have not been used since the "first nuclear age," but whether this will continue in the future "nuclear age" may rest on this point. Therefore, it is necessary to keep a close watch on these developments.

Next, it was revealed that nuclear compellence might succeed under certain conditions, but that meeting these conditions is not easy. Ohnishi reviewed previous studies on nuclear compellence and explained that the madman theory and brinkmanship mechanisms are being considered to ensure the credibility of nuclear threats, and that due in part to empirical challenges, opinions are divided on the effectiveness of nuclear compellence even in previous research. Ohnishi analyzed the Cuban Missile Crisis and the Sino-Soviet Border Conflict as successful examples of deliberate nuclear compellence among nuclear-armed states, and the Berlin Crisis, the 2017-2018 Korean Peninsula Crisis, and the Russo-Ukrainian War as unsuccessful ones. As a result of this comparative analysis, he noted that numerous conditions may need to be met for nuclear compellence to succeed. A series of case studies from the "first nuclear age" to the "second nuclear age" found that both successful cases occurred during the Cold War. This suggests that, so far, nuclear compellence has functioned more effectively in the "first nuclear age" than in the "second nuclear age." Having said that, the limited number of successful examples of nuclear compellence makes it difficult to affirm its effectiveness, making further case analysis necessary, including of the consequences of the Russo-Ukrainian War.

A concept closely associated with the credibility of nuclear threats is reputation that Maeda examined in his column. While it is intuitively thought that the credibility of commitments is influenced by past words and actions, it in fact embodies highly complex theoretical issues. Questions such as whether reputation concerns a state or an individual, how long reputation lasts, how it attenuates over time, and whether reputation pertains to resolve or capability have yet to be solved academically. However, as nuclear threats become prevalent and the "revival of nuclear weapons" is felt in various regions, it is clear that deterrence theory will need a more elaborate analytical framework in response to new developments in the "nuclear age." This is already becoming apparent: for example, Maeda has observed that recent years have seen a resurgence in reputation studies whose theoretical significance had been questioned after the Cold War. As with the aforementioned nuclear compellence, it is expected that the theoretical study of reputation will generate new academic findings.

In his study of new domains, such as space, cyberspace, and the electromagnetic domain, and nuclear weapons systems, Arie warned that cross-domain warfare and emerging technologies pose the risk of destabilizing the nuclear command, control, and communications (NC3) of nuclear-weapon states and nuclear-armed states. He reiterated the importance of arms control, noting that more stable nuclear deterrence requires having a shared awareness of acceptable activities, maintaining the possibility of disproportionate retaliation, benefitting from using nonnuclear assets in one domain to deter attacks in another domain, and strengthening continuous monitoring and resilience against threats to NC3. Specific measures proposed include introducing regulations in outer space (orbit) based on a normative approach, prohibiting attacks on NC3 in cyberspace, regulating NC3 attacks by directed-energy weapons in the electromagnetic domain, regulating attacks in the cognitive domain that could further incentivize preemptive strikes, and regulating the integration of artificial intelligence into NC3 systems. Unlike the logic of nuclear arms control in the "first nuclear age," the targets are not easily identifiable weapons and many have low visibility. They are approaches that aim to improve strategic stability by focusing on behavior. It is a new perspective that emerged in today's "second nuclear age."

In a study of nuclear weapon policy and arms control, Ichimasa examined negative security assurances (NSAs) about which concerns heightened following Russia's invasion of Ukraine, as well as the no first use (NFU) policy adopted by China whose increasing nuclear arsenals is drawing attention. Based on the nuclear doctrines of nuclear powers, it was highlighted that, while all states are advancing modernization of nuclear weapons: (1) the United States, the United Kingdom, and France are seeking to strengthen arms control and maintain the status quo; (2) Russia does not appear to want an aggressive nuclear arms race, but it does not hesitate to withdraw from arms control treaties that do not align with its national interests; (3) China is distancing itself from U.S.-Russia arms control negotiations, seeking its position within a new international nuclear order; and (4) India and Pakistan adopt a logic different from Cold War-era nuclear deterrence theory. In addition, Ichimasa explained that U.S. and Russian actions related to arms control agreements during the post-Cold War era, changes in the security environment, uncertainty surrounding the outcomes of great power competition, and the pursuit of nuclear superiority have led to the "end of arms control 'treaties" that is seen today. Based on recent developments in the arms control discourses, he proposed a "reasonable approach to arms control under great power competition." In the short term, it calls for technologically updating hotlines, fostering a shared understanding of strategic stability, and maintaining nuclear nonproliferation norms, while in the medium to long term, for verifiable arms control treaties and conditional NFU agreements between specified states to

avoid inadvertent nuclear war.

The issue of nuclear proliferation is attracting more attention in the context of the "revival of nuclear weapons." A nuclear threshold state's use of nuclear leverage discussed by Yoshida is a highly suggestive concept. Taking Iran as an example, he argued that despite the existence of external and internal factors regulating the development of nuclear weapons in the country, Iran may have used nuclear leverage as diplomatic pressure to exert influence on other countries, with some administrations viewing Iran as a state with a virtual nuclear arsenal. Such nuclear leverage may continue to evolve in form and persist alongside the risk of nuclear proliferation, and it needs to be closely monitored.

Taking the above into account, the question asked in the introduction chapter is revisited: "What political and military changes will the 'nuclear age' undergo in the future, and how will they shape the international security environment?" As discussed in this book from a range of different perspectives, there may be further horizontal and vertical proliferation of nuclear weapons amid a "revival of nuclear weapons." Coupled with increasingly complex deterrence calculations, there is concern that they will undermine the international nuclear order. Furthermore, arms control treaties that are intended to contribute to strategic stability are facing a crisis of termination, which is expected to make the management of great power competition more challenging in a world of "three nuclear superpowers."

Another question asked was "how are nuclear deterrence, strategic stability, compellence based on nuclear threats, the expansion of domains into space, cyberspace, and the electromagnetic spectrum, nuclear weapons systems, and arms control expected to change or not change?" To answer this question, a detailed study of nuclear deterrence concepts relevant to the contemporary security situation is necessary. This includes the possibility that conflicts may arise over the lower bound of the impact of MAD on sub-strategic stability. The discourse is showing signs that nuclear deterrence theory is changing in the midst of the "second nuclear age." While examples with uncertain outcomes like the Russo-Ukrainian War require continued monitoring, nuclear compellence has yet to succeed in the "second nuclear age," and fulfilling the basic requirements for compellence is not easy. Therefore, it can be concluded that there have not been considerable changes in the concept.

The rise of non-nuclear means of attack in difficult-to-visualize new domains may provide advantages to states that introduce them while potentially threatening the destabilization of NC3 for others. For this reason, some emphasize the increasing need for a normative arms control approach that focuses on behavior. In this regard, nuclear weapons systems are facing significant changes in the ongoing "second nuclear age." As for arms control, as major states modernize nuclear weapons and arguments in support for nuclear superiority grow, a quarter century of U.S.-Russian attitudes toward arms control and the transformation of the security environment during this period resulted in the "end of arms control 'treaties'." Given the unsettled state of great power competition, the conclusion of verifiable arms control treaties that expand participation to states beyond the United States and Russia must be considered a mid-to-long-term goal. In other words, arms control too is reaching a critical turning point in today's "second nuclear age."

Furthermore, the questions of how strategic stability should be maintained in the "new horizons of the nuclear age" and how this strategic stability should be conceived today were revisited from several perspectives throughout this book. In discussing the issues raised in the introduction chapter-the "revival of nuclear weapons" and heightened expectations and concerns surrounding nuclear deterrence, the "three nuclear superpowers," nuclear proliferation and modernization, and arms control-it is noteworthy that they invariably focused on the implications for strategic stability, including maintaining and enhancing strategic stability, concerns about the adverse effects on strategic stability, and the loss of functions intended to improve strategic stability. Each chapter analyzed numerous studies on strategic stability and provided its own observations. In sum, one approach is to broaden the concept of strategic stability so that it is not limited to the context of nuclear weapons. For example, strategic stability may imply an absence of incentives for military aggression, a highly predictable security environment, diplomatic management of interstate competition, and the functioning of confidence-building and conflict prevention under agreed mechanisms. Another approach is to narrow the focus of strategic stability to the stabilization of nuclear deterrence, such as thwarting military clashes and nuclear exchanges between nuclear-armed states and stabilizing interstate nuclear confrontations including MAD.

Then, what kind of strategic stability is demanded in today's "nuclear age"? Generally, it is often more appropriate to pursue a broad approach to strategic stability. As confrontations among nuclear powers become increasingly complex and they are in a race to modernize nuclear arsenals, priority should be given to managing rivalries more comprehensively in order to prevent inadvertent escalation of conflicts due to misunderstandings, miscalculations, or accidents. This is not to deny, of course, the possibility of bilateral or trilateral efforts to achieve stability through nuclear deterrence. It is natural that all nuclear-weapon states and nuclear-armed states respectively seek strategic stability. In this regard, it should be recognized

that while MAD may still be effective in some cases, it may not be in others.

At the same time, strategic stability is perceived differently among great powers, nuclear-weapon states, and nuclear-armed states. In an era where the Treaty on the Prohibition of Nuclear Weapons has been negotiated and entered into force, it is important not to overlook what type of strategic stability is desired by many non-nuclear-weapon states. Thus, a challenge ahead will be to foster a common understanding through dialogue on what kind of strategic stability should be pursued in the contemporary "nuclear age." In doing so, it will be essential to first deepen the understanding of strategic stability between the United States and its allies and partner countries and maintain and improve deterrence capabilities, along with considering the establishment of new mechanisms to avoid inadvertent escalation.

Fortunately, nuclear weapons have never been used in the nearly 80 years since the atomic bombings of Hiroshima and Nagasaki. Some argue that a certain intersubjective taboo on the use of nuclear weapons prevails in the international community and has inhibited their use.¹ However, as great power competition intensifies and the "long shadow of nuclear weapons" begins to re-emerge amid the "revival of nuclear weapons," new domains and advanced technologies are increasingly likely to threaten the stability of nuclear deterrence. Furthermore, strategic stability that relied on MAD, which became mainstream in the "first nuclear age," does not necessarily offer a solid theoretical foundation for all nuclear-armed states. As nuclear threats and nuclear compellence become widespread, this book draws the conclusion that it is imperative to take reasonable arms control measures to prevent inadvertent nuclear war while maintaining and improving deterrence capabilities.

The various issues surrounding nuclear weapons that this book focused on have all been explored extensively since the Cold War era, and this book's attempt to make sense of the "new horizons of the nuclear age" has greatly benefited from such literature. Compared to the numerous preceding scholarship on nuclear weapons and their vast scope, the findings compiled in this book represent only the beginning of the research. There remains much to be studied about the theoretical and policy-related challenges of the "nuclear age," and further academic research from all the authors is eagerly awaited.

Nina Tannenwald, "Stigmatizing the Bomb: Origins of the Nuclear Taboo," International Security 29, no. 4 (Spring 2005): 5-49.