

# FOREWORD

**H**enry Sokolski has written an excellent, short book about what he sees as our not so peaceful nuclear future. While short in length, it covers a lot of ground, and because it is extensively footnoted, it can lead readers to the broader literature.

The book provides a good picture of the growing stockpiles of separated plutonium and the stockpiles of highly-enriched uranium, as well as the likely expansion of nuclear power programs in additional countries. When reading the book, my thoughts turned to the Per Bak book, *How Nature Works*, and the concept of self-organized criticality and its descriptions of computer simulations and experiments leading to avalanches in sand piles. This may be a useful way of thinking about the possible consequences for nuclear weapon proliferation as the stockpiles of fissile material grow.

Also, as we think about the likelihood of the proliferation of nuclear weapons, we should be aware that developing nuclear weapons may be easier as time passes and computing power increases, high energy explosives improve, and diagnostic technology advances.

Sokolski includes a discussion of the question, does it matter if more countries have nuclear weapons. He points out that a

number of respected people say it doesn't; some say it would be a more stable world. Sokolski disagrees; I am with him, for two reasons. First, those who say it won't matter, I believe, tend to assume that deterrence of attacks by others is almost automatic. There is little discussion of the vulnerability of the weapons, delivery systems, command and central systems, and more. Having a well-protected second-strike capability historically was not automatic; it took time and effort, changed operational practices, etc. Second, the Russians have been writing for at least the past fifteen years of the need they have for tactical nuclear weapons to defend their large territory, because they say they do not have the resources to defend conventionally. They call for a new generation of nuclear weapons that would be easier to use. They more recently have developed an interest in the early use of tactical nuclear weapons to quickly de-escalate a conflict.

If such use occurred, especially if it led to the successful de-escalation of a conflict on their borders, it might be a trigger for an avalanche of proliferation, a la Per Bak's sand piles, a much larger avalanche than, in the case of Iran, getting nuclear weapons, which has been the subject of several studies in recent years. The successful Russian use would be the first operational use of nuclear weapons in many decades and would revive consideration of the value of tactical nuclear weapons. In any case, it is not clear that this would be a very peaceful world.

The problems arising from the growing stockpiles are addressed in the book and some ideas are put forward—a good start on how to limit the dangers that may flow from that growth. The author raises important questions that deserve continued attention.

*Andrew W. Marshall*