

Natural security

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Science in general – and biology in particular – play only limited roles in the development of national security policy. But an unusual collective of biologists and national-security experts say that the evolutionary record shouldn't be overlooked as a source of strategy ideas.

Terrorism, West Nile virus, and Hurricane Katrina are examples of the conflicts, diseases, and natural disasters that pose ongoing threats to national security in the 21st century. Yet, national-security policy critics suggest that outdated strategies are useless against these modern challenges. “Adaptability is necessary for any species to survive”, says Terence Taylor, the former UN Chief Weapons Inspector in Iraq and current Director of the International Council for the Life Sciences (Washington, DC). But, he adds, Al Qaeda continues to thrive because they employ more adaptive strategies than does the US. Taylor and co-authors of the recently released *Natural security: a Darwinian approach to a dangerous world* believe that the legacy of attacks and counterattacks used by extant organisms over the past 3.5 billion years could serve as a species' survival guide.

In the wake of the 9/11 attacks, Rafe Sagarin, then a Geological Society of America Congressional fellow, grew increasingly uneasy and frustrated as unvarying “security” protocols were put in place – particularly in airports. After writing a short essay about security-relevant natural history observations in *Foreign Policy*, Sagarin convinced the National Center for Ecological Analysis and Synthesis, a Santa Barbara, CA-based think tank, to pay for a series of meetings between national-security experts and biologists. The eager and receptive response of the national-



Taking a cue from nature, this 6-inch, robotic spy plane is modelled after a bat.

E. Maslowski/Univ of Michigan 3D Lab

security experts confirmed that they were looking for new approaches.

Sagarin, co-editor of *Natural security* and current Associate Director for Ocean and Coastal Policy at Duke University's Nicholas Institute for Environmental Policy Solutions (Durham, NC), suggests that an evolutionary perspective can shed light on how to best organize responses to threats. “You don't see organisms trying to eliminate risk in their environment; they develop behaviors to lessen the uncertainty of the risk”, he explains. Sagarin further suggests that effective security systems must follow nature's example, by incorporating variability and unpredictability to thwart attackers.

One central tenet of the book is that centralized organizational structures are unable to sense the environment and respond accordingly. Rather, nature provides examples of successful systems that rely on multiple independent sensors to better assess and respond to security threats – for example, the intricate series of alarm signals used by marmots.

Security analysts are receptive to the ideas put forth in the book. As in the example of the ancient mollusks that evolved defenses ranging from modified shell armor to restrict access, larger shells that are harder to manipulate, and the use of toxins, the paleontological and contemporary examples reinforced the importance of adaptation to the environment, says Taylor.

But the flexibility to be adaptive is lost in the bureaucracy of the Department of Homeland Security, notes Sagarin. “We are still structuring our military forces and intelligence services for the Cold War”, says former Senator Gary Hart, currently the Chairman for Council for a Livable World (Denver, CO). Hart recounts an old saying – “no great power ever reformed its military absent a major defeat” – that, he believes, is unfortunately true. “It will be a long, complex process to get beyond the Cold War mentality and think creatively about 21st-century security”, he says. Taylor and Hart agree that security policies will begin to change only with a new generation of leaders. Continues Hart, “Having fresh thinkers who do not have stakes in the old systems is crucial.”

Indeed, the intelligence community has proved receptive to borrowing paradigms and analogies from other disciplines, according to Ellen Laipson, President and CEO of the Henry L Stimson Center, a national-security think tank based in Washington, DC. For example, Laipson says intelligence analysts have looked at how groups of animals live together in hostile environments. “We are a complex organism down here in Washington, and a book like this can have influence, inasmuch as key individuals can champion these ideas”.

One such leader, Alex Dehgan, the chief of staff to the Secretary of State's Scientific Advisor, says evolutionary insights can help the security community shape theories from well-tested case studies with thousands of replicates, studies impossible to do in the real world.

With that in mind, Taylor and Sagarin have created a website for the book and hope to share their ideas further up the security hierarchy. “We are not suggesting this is a rule book on how to change policy, but with few new ideas popping up, we do offer a compelling perspective on security”, concludes Sagarin. ■