

Joshua Lederberg:

Notes:

T/75 Military S&T in a changing world. Senior Technologists
Conference. 5/23/95 NAS

re asymmetry

Stand in for John Deutch

Only mitigated by Anita Jones having given me only a couple of days to fret about it.

Also helped, had an extraordinary opportunity to hear both from Bill Perry and John Shalikashvili, their insightful perspectives. If I did nothing more than echo their main points, this trip would have been worthwhile. Without further specific attribution, they allude in depth to:

- 1) Obvious changes in world environment: the brief window of time during which US remains a unique superpower. We do understand how quickly the motivation to undertake the necessary sacrifices, and to sustain the basic civility at home, may dissipate absent a credible external threat. {I personally think there is one, epidemic disease, but I'd have to be a real optimist to believe that will refashion how we behave to one another.}
- 2) The budgetary revolution -- related to what I just said. More clamorous claims on a possibly smaller pie. But just possibly, smaller will be proportionately more effective with the help of new technology.
- 3) The "RMA", which means different things to different people, but specifically the precision guided munition, and what it entails in the capture and effective use of information, including where your friendly forces are -- in a sometimes difficult alliance coalition.

And you will be hearing even more about "jointness", how this is succeeding!! It doesn't take much imagination to see how this is dependent on precise information: if I mention close-air support you get a prototypic example.

There are further implications that have been well articulated. Public tolerance for casualties is vanishingly, even unrealistically low. The same for post-combat ailments that may or may not have any real connection with exposures to dioxin or to oil-fire pollutants. And that intolerance goes to all but the minimum level of casualties imposed on "enemy" civilians as well. That will not stop the bad guys from using their own populations, even their babies as shields -- one of their most devastating tactics.

Before this political-military revolution is crystallized, there deserves to be continued ferment about what our technology can and cannot or might deliver. I think of Ed Luttwak's admonitions in his book on Strategy, that we systematically underestimate the adversary's motive to subvert our most obvious strengths. Wherever we excel, he will strike somewhere else.

So it may be built in, that the RMA will be largely irrelevant to our actual missions, as they are shaped, largely in reaction to our developed capabilities.

cc: Dana 3/3/97

Can we think of the technologies that would really make a big difference in Somalia, Kurdistan, or Bosnia? Or to discourage (at minimum detect) nuclear proliferation in Iran and N. Korea? That will support the dream, or call it fantasy, of a de-nuclearized world; or if not that allow us assurances of the integrity of our own stockpile while enabling a universal test ban that will give us further reassurance about non-proliferation.

What concerns me most of all is that warfare will be redefined, and that Aum Shinrikyo is the precursor to that, with the all too ready availability of biological and chemical weapons. The violence these can inflict is of the same order as full scale warfare. These gray zones between civil and military responsibility are just those where we are surely least well prepared.

Let me turn from geopolitics to more technocratic considerations.

Again quoting our leaders, it is imperative that we view our national technological base as a unity: we cannot afford a fenced-in military industry: neither to meet the production requirements of military equipment, nor to compete effectively in a global economy. It will take a lot of unlearning to get this right. In fact, it is not strictly a national base -- you have to look at the sources for many of your equipment components. That interdependence has many pros and cons for the shape of a peaceful world; but we have to live with it in any case.

Technology has also become very disperse, in disciplines as well as geography: we see the most exciting developments in the boundaries of physical and biological sciences. Learning how to learn across such boundaries become an ever more pressing challenge, but one that is not well handled in our schools. "Whatever it takes to solve a real-world problem" calls on a wider range and integration of skills than is furnished in discipline oriented textbooks, classes, and PhD dissertations. Put it another way, the invigoration of human resources is one of our most exciting technical challenges; but we do have wonderful tools in the new information and communications technologies.

I would be hard put to say that our current systems of technical education, or for that matter of contract and grant awards accord very much with those underlying goals. In fact, a disaster seems to be brewing in the demotivation of this decade's cadre of young native scientists, although we will continue to be bailed out by emigres from other countries whose science policies have been bankrupted even sooner, or were too poor to start with. But I do not doubt there will be increasing impediments generated by our immigration policies: we had better hope for, or help bring about, improvement in our neighbor countries' schools to make up for our own.