# 1AC

## Leadership

#### Contention one is leadership—

#### Space law solves multiple extinction scenarios

Hays 10

(Peter, PhD and director of the U.S. Air Force Institute for National Security Studies, “Space Law and the Advancement of Spacepower” December 13, 2010, NDU Press Chapter 28, <http://www.ndu.edu/press/space-Ch28.html>

Other impediments to further developing space law are exacerbated by a lack of acceptance in some quarters that sustained, cooperative efforts are often the best and sometimes the only way in which humanity can address our most pressing survival challenges. Cosmic threats to humanity's survival exist and include the depletion of resources and fouling of our only current habitat, threats in the space environment such as large objects that could strike Earth and cause cataclysmic damage, and the eventual exhaustion and destruction of the Sun. The message is clear: environmental degradation and space phenomena can threaten our existence, but humanity can improve our odds for survival if we can cooperate in grasping and exploiting survival opportunities. Law can provide one of the most effective ways to structure and use these opportunities. Sustained dialogue of the type this volume seeks to foster can help raise awareness, generate support for better space law, and ultimately nurture the spacepower needed to improve our odds for survival. The Quest for Sustainable Security In examining space law, spacepower, and humanity's quest for sustainable security, it is prudent for spacefaring actors to transcend traditional categories and approaches by considering resources in novel, broad, and multidimensional ways. This chapter attempts to employ the spirit of this unrestrained approach but is not suggesting that everything discussed would necessarily turn out to be useful or implementable in the real world. In addition, it is often not practical or even possible to examine space law developments in discrete ways by delineating between legal, technical, and policy considerations or between terrestrial and space security concerns. Over the long run, however, an expansive approach will undoubtedly reveal and help create the most opportunities to advance space law and spacepower in the most significant and lasting ways. Nonetheless, when beginning the journey, small, incremental steps are the most pragmatic way to develop and implement more effective space law, and the process should first focus on improving and refining the foundation provided by the OST regime.

#### Space debris leads to US-Russia nuclear war

Lewis 4

Postdoctoral Fellow in the Advanced Methods of Cooperative Study Program Jeffrey, Worked In the Office of the Undersecretary of Defense for Policy, Center for Defense Information, What if Space Were Weaponized? July, http://www.cdi.org/PDFs/scenarios.pdf

This is the second of two scenarios that consider how U.S. space weapons might create incentives for America’s opponents to behave in dangerous ways. The previous scenario looked at the systemic risk of accidents that could arise from keeping nuclear weapons on high alert to guard against a space weapons attack. This section focuses on the risk that a single accident in space, such as a piece of space debris striking a Russian early-warning satellite, might be the catalyst for an accidental nuclear war. As we have noted in an earlier section, the United States canceled its own ASAT program in the 1980s over concerns that the deployment of these weapons might be deeply destabilizing. For all the talk about a “new relationship” between the United States and Russia, both sides retain thousands of nuclear forces on alert and configured to fight a nuclear war. When briefed about the size and status of U.S. nuclear forces, President George W. Bush reportedly asked “What do we need all these weapons for?”43 The answer, as it was during the Cold War, is that the forces remain on alert to conduct a number of possible contingencies, including a nuclear strike against Russia. This fact, of course, is not lost on the Rus- sian leadership, which has been increasing its reliance on nuclear weapons to compensate for the country’s declining military might. In the mid-1990s, Russia dropped its pledge to refrain from the “first use” of nuclear weapons and conducted a series of exercises in which Russian nuclear forces prepared to use nuclear weapons to repel a NATO invasion. In October 2003, Russian Defense Minister Sergei Ivanov reiter- ated that Moscow might use nuclear weapons “preemptively” in any number of contingencies, including a NATO attack.44 So, it remains business as usual with U.S. and Russian nuclear forces. And business as usual includes the occasional false alarm of a nuclear attack. There have been several of these incidents over the years. In September 1983, as a relatively new Soviet early-warning satellite moved into position to monitor U.S. missile fields in North Dakota, the sun lined up in just such a way as to fool the Russian satellite into reporting that half a dozen U.S. missiles had been launched at the Soviet Union. Perhaps mindful that a brand new satel- lite might malfunction, the officer in charge of the command center that monitored data from the early-warning satellites refused to pass the alert to his superiors. He reportedly explained his caution by saying: “When people start a war, they don’t start it with only five missiles. You can do little damage with just five missiles.”45 In January 1995, Norwegian scientists launched a sounding rocket on a trajectory similar to one that a U.S. Trident missile might take if it were launched to blind Russian radars with a high26 What if Space Were Weaponized? altitude nuclear detonation. The incident was apparently serious enough that, the next day, Russian President Boris Yeltsin stated that he had activated his “nuclear football” – a device that allows the Russian president to communicate with his military advisors and review his options for launching his arsenal. In this case, the Russian early-warning satellites could clearly see that no attack was under way and the crisis passed without incident.46 In both cases, Russian observers were confi- dent that what appeared to be a “small” attack was not a fragmentary picture of a much larger one. In the case of the Norwegian sounding rocket, space-based sensors played a crucial role in assuring the Russian leadership that it was not under attack. The Russian command sys- tem, however, is no longer able to provide such reliable, early warning. The dissolution of the Soviet Union cost Moscow several radar stations in newly independent states, creating “attack corridors” through which Moscow could not see an attack launched by U.S. nuclear submarines.47 Further, Russia’s constellation of early-warn- ing satellites has been allowed to decline – only one or two of the six satellites remain operational, leaving Russia with early warning for only six hours a day. Russia is attempting to reconstitute its constellation of early-warning satellites, with several launches planned in the next few years. But Russia will still have limited warning and will depend heavily on its space-based systems to provide warning of an American attack.48 As the previous section explained, the Pentagon is contemplating military missions in space that will improve U.S. ability to cripple Russian nuclear forces in a crisis before they can execute an attack on the United States. Anti-satellite weapons, in this scenario, would blind Russian reconnaissance and warning satellites and knock out communications satellites. Such strikes might be the prelude to a full-scale attack, or a limited ef- fort, as attempted in a war game at Schriever Air Force Base, to conduct “early deterrence strikes” to signal U.S. resolve and control escalation.49 By 2010, the United States may, in fact, have an arsenal of ASATs (perhaps even on orbit 24/7) ready to conduct these kinds of missions – to coerce opponents and, if necessary, support preemptive attacks. Moscow would certainly have to worry that these ASATs could be used in conjunction with other space-enabled systems – for example, long-range strike systems that could attack targets in less than 90 minutes – to disable Russia’s nuclear deterrent before the Rus- sian leadership understood what was going on. What would happen if a piece of space debris were to disable a Russian early-warning satellite under these conditions? Could the Russian military distinguish between an accident in space and the first phase of a U.S. attack? Most Russian early-warning satellites are in elliptical Molniya orbits (a few are in GEO) and thus difficult to attack from the ground or air. At a minimum, Moscow would probably have some tactical warn- ing of such a suspicious launch, but given the sorry state of Russia’s warning, optical imaging and signals intelligence satellites there is reason to ask the question. Further, the advent of U.S. on-orbit ASATs, as now envisioned50 could make both the more difficult orbital plane and any warning systems moot. The unpleasant truth is that the Russians likely would have to make a judgment call. No state has the ability to definitively deter- mine the cause of the satellite’s failure. Even the United States does not maintain (nor is it likely to have in place by 2010) a sophisticated space surveillance system that would allow it to distin- guish between a satellite malfunction, a debris strike or a deliberate attack – and Russian space surveillance capabilities are much more limited by comparison. Even the risk assessments for col- lision with debris are speculative, particularly for the unique orbits in which Russian early-warning satellites operate. During peacetime, it is easy to imagine that the Russians would conclude that the loss of a satellite was either a malfunction or a debris strike. But how confident could U.S. planners be that the Russians would be so calm if the accident in space occurred in tandem with a second false alarm, or occurred during the middle of a crisis? What might happen if the debris strike occurred shortly after a false alarm showing a missile launch? False alarms are appallingly common – according to information obtained under the Freedom of Information Act, the U.S.-Canadian North American Aerospace Defense Command (NORAD) experienced 1,172 “moderately serious” false alarms between 1977 and 1983 – an average of almost three false alarms per week. Comparable information is not available about the Russian system, but there is no reason to believe that it is any more reliable.51 Assessing the likelihood of these sorts of co- incidences is difficult because Russia has never provided data about the frequency or duration of false alarms; nor indicated how seriously early- warning data is taken by Russian leaders. More- over, there is no reliable estimate of the debris risk for Russian satellites in highly elliptical orbits.52 The important point, however, is that such a coincidence would only appear suspicious if the United States were in the business of disabling satellites – in other words, there is much less risk if Washington does not develop ASATs. The loss of an early-warning satellite could look rather ominous if it occurred during a period of major tension in the relationship. While NATO no longer sees Russia as much of a threat, the same cannot be said of the converse. Despite the warm talk, Russian leaders remain wary of NATO expansion, particularly the effect expansion may have on the Baltic port of Kaliningrad. Although part of Russia, Kaliningrad is separated from the rest of Russia by Lithuania and Poland. Russia has already complained about its decreasing lack of access to the port, particularly the uncooperative attitude of the Lithuanian govern- ment.53 News reports suggest that an edgy Russia may have moved tactical nuclear weapons into the enclave.54 If the Lithuanian government were to close access to Kaliningrad in a fit of pique, this would trigger a major crisis between NATO and Russia. Under these circumstances, the loss of an early-warning satellite would be extremely suspicious. It is any military’s nature during a crisis to interpret events in their worst-case light. For ex- ample, consider the coincidences that occurred in early September 1956, during the extraordinarily tense period in international relations marked by the Suez Crisis and Hungarian uprising.55 On one evening the White House received messages indicating: 1. the Turkish Air Force had gone on alert in response to unidentified aircraft penetrating its airspace; 2. one hundred Soviet MiG-15s were flying over Syria; 3. a British Canberra bomber had been shot down over Syria, most likely by a MiG; and 4. The Russian fleet was moving through the Dardanelles. Gen. Andrew Goodpaster was reported to have worried that the confluence of events “might trigger off ... the NATO operations plan” that called for a nuclear strike on the Soviet Union. Yet, all of these reports were false. The “jets” over Turkey were a flock of swans; the Soviet MiGs over Syria were a smaller, routine escort returning the president from a state visit to Moscow; the bomber crashed due to mechanical difficulties; and the Soviet fleet was beginning long-scheduled exercises. In an important sense, these were not “coincidences” but rather different manifestations of a common failure – human error resulting from extreme tension of an international crisis. As one author noted, “The detection and misinterpretation of these events, against the context of world tensions from Hungary and Suez, was the first major example of how the size and complexity of worldwide electronic warning systems could, at certain critical times, create momentum of its own.” Perhaps most worrisome, the United States might be blithely unaware of the degree to which the Russians were concerned about its actions and inadvertently escalate a crisis. During the early 1980s, the Soviet Union suffered a major “war scare” during which time its leadership concluded that bilateral relations were rapidly declining. This war scare was driven in part by the rhetoric of the Reagan administration, fortified by the selective reading of intelligence. During this period, NATO conducted a major command post exercise, Able Archer, that caused some elements of the Soviet military to raise their alert status. American officials were stunned to learn, after the fact, that the Kremlin had been acutely nervous about an American first strike during this period.56 All of these incidents have a common theme – that confidence is often the difference between war and peace. In times of crisis, false alarms can have a momentum of their own. As in the second scenario in this monograph, the lesson is that commanders rely on the steady flow of reliable information. When that information flow is disrupted – whether by a deliberate attack or an accident – confidence collapses and the result is panic and escalation. Introducing ASAT weapons into this mix is all the more dangerous, because such weapons target the elements of the command system that keep leaders aware, informed and in control. As a result, the mere presence of such weapons is corrosive to the confidence that allows national nuclear forces to operate safely.

#### Weaponization guarantees accidental and intentional nuclear conflict—also bioweapons usage

Mitchell et al ‘1

Dr. Gordon, Associate Professor of Communication and Director of Debate at the University of Pittsburgh. ISIS Briefing on Ballistic Missile Defence, “Missile Defence: Trans-Atlantic Diplomacy at a Crossroads”, No. 6 July, http://www.isisuk.demon.co.uk/0811/isis/uk/bmd/no6.html)

A buildup of space weapons might begin with noble intentions of 'peace through strength' deterrence, but this rationale glosses over the tendency that '… the presence of space weapons…will result in the increased likelihood of their use'.33 This drift toward usage is strengthened by a strategic fact elucidated by Frank Barnaby: when it comes to arming the heavens, 'anti-ballistic missiles and anti-satellite warfare technologies go hand-in-hand'.34 The interlocking nature of offense and defense in military space technology stems from the inherent 'dual capability' of spaceborne weapon components. As Marc Vidricaire, Delegation of Canada to the UN Conference on Disarmament, explains: 'If you want to intercept something in space, you could use the same capability to target something on land'. 35 To the extent that ballistic missile interceptors based in space can knock out enemy missiles in mid-flight, such interceptors can also be used as orbiting 'Death Stars', capable of sending munitions hurtling through the Earth's atmosphere. The dizzying speed of space warfare would introduce intense 'use or lose' pressure into strategic calculations, with the spectre of split-second attacks creating incentives to rig orbiting Death Stars with automated 'hair trigger' devices. In theory, this automation would enhance survivability of vulnerable space weapon platforms. However, by taking the decision to commit violence out of human hands and endowing computers with authority to make war, military planners could sow insidious seeds of accidental conflict. Yale sociologist Charles Perrow has analyzed 'complexly interactive, tightly coupled' industrial systems such as space weapons, which have many sophisticated components that all depend on each other's flawless performance. According to Perrow, this interlocking complexity makes it impossible to foresee all the different ways such systems could fail. As Perrow explains, '[t]he odd term "normal accident" is meant to signal that, given the system characteristics, multiple and unexpected interactions of failures are inevitable'.36 Deployment of space weapons with pre-delegated authority to fire death rays or unleash killer projectiles would likely make war itself inevitable, given the susceptibility of such systems to 'normal accidents'. It is chilling to contemplate the possible effects of a space war. According to retired Lt. Col. Robert M. Bowman, 'even a tiny projectile reentering from space strikes the earth with such high velocity that it can do enormous damage — even more than would be done by a nuclear weapon of the same size!'. 37 In the same Star Wars technology touted as a quintessential tool of peace, defence analyst David Langford sees one of the most destabilizing offensive weapons ever conceived: 'One imagines dead cities of microwave-grilled people'.38 Given this unique potential for destruction, it is not hard to imagine that any nation subjected to space weapon attack would retaliate with maximum force, including use of nuclear, biological, and/or chemical weapons. An accidental war sparked by a computer glitch in space could plunge the world into the most destructive military conflict ever seen.

#### Bioweapons use causes extinction

Steinbrenner, 97

John Steinbrenner, Senior Fellow – Brookings, Foreign Policy, 12-22-1997, Lexis

Although human pathogens are often lumped with nuclear explosives and lethal chemicals as potential weapons of mass destruction, there is an obvious, fundamentally important difference: Pathogens are alive, weapons are not. Nuclear and chemical weapons do not reproduce themselves and do not independently engage in adaptive behavior; pathogens do both of these things. That deceptively simple observation has immense implications. The use of a manufactured weapon is a singular event. Most of the damage occurs immediately. The aftereffects, whatever they may be, decay rapidly over time and distance in a reasonably predictable manner. Even before a nuclear warhead is detonated, for instance, it is possible to estimate the extent of the subsequent damage and the likely level of radioactive fallout. Such predictability is an essential component for tactical military planning. The use of a pathogen, by contrast, is an extended process whose scope and timing cannot be precisely controlled. For most potential biological agents, the predominant drawback is that they would not act swiftly or decisively enough to be an effective weapon. But for a few pathogens - ones most likely to have a decisive effect and therefore the ones most likely to be contemplated for deliberately hostile use - the risk runs in the other direction. A lethal pathogen that could efficiently spread from one victim to another would be capable of initiating an intensifying cascade of disease that might ultimately threaten the entire world population. The 1918 influenza epidemic demonstrated the potential for a global contagion of this sort but not necessarily its outer limit.

#### Hegemonic decline causes nuclear war

Barnett ‘11

Thomas, American military geostrategist and Chief Analyst at Wikistrat, “The New Rules: Leadership Fatigue Puts U.S., and Globalization, at Crossroads,” <http://www.worldpoliticsreview.com/articles/8099/the-new-rules-leadership-fatigue-puts-u-s-and-globalization-at-crossroads>, AM

Let me be more blunt: As the guardian of globalization, **the U.S. military has been the greatest force for peace the world has ever known**. Had America been removed from the global dynamics that governed the 20th century, the mass murder never would have ended. Indeed, it's entirely conceivable **there would** now **be no** identifiable **human civilization left**, **once nuclear weapons entered the** killing **equation**. But the world did not keep sliding down that path of perpetual war. Instead, America stepped up and changed everything by ushering in our now-**perpetual great-power peace**. We introduced the international liberal trade order known as globalization and played loyal Leviathan over its spread. What resulted was the collapse of empires, an explosion of democracy, the persistent spread of human rights, the liberation of women, the doubling of life expectancy, a roughly 10-fold increase in adjusted global GDP and a profound and persistent reduction in battle deaths from state-based conflicts. That is what American "hubris" actually delivered.

#### Best studies validate hegemonic stability theory–it is the proximate cause of peace

Owen ‘11

John M. Owen Professor of Politics at University of Virginia PhD from Harvard "DON’T DISCOUNT HEGEMONY" Feb 11 [www.cato-unbound.org/2011/02/11/john-owen/dont-discount-hegemony/](http://www.cato-unbound.org/2011/02/11/john-owen/dont-discount-hegemony/)

Andrew Mack and his colleagues at the Human Security Report Project are to be congratulated. Not only do they present a study with a striking conclusion, driven by data, free of theoretical or ideological bias, but they also do something quite unfashionable: they bear good news. Social scientists really are not supposed to do that. Our job is, if not to be Malthusians, then at least to point out disturbing trends, looming catastrophes, and the imbecility and mendacity of policy makers. And then it is to say why, if people listen to us, things will get better. We do this as if our careers depended upon it, and perhaps they do; for if all is going to be well, what need then for us? Our colleagues at Simon Fraser University are brave indeed. That may sound like a setup, but it is not. I shall challenge neither the data nor the general conclusion that **violent conflict around the world has been decreasing in fits** and starts since the Second World War. When it comes to **violent conflict among and within countries**, things have been getting better. (The trends have not been linear—Figure 1.1 actually shows that the frequency of interstate wars peaked in the 1980s—but the 65-year movement is clear.) Instead I shall accept that Mack et al. are correct on the macro-trends, and focus on their explanations they advance for these remarkable trends. With apologies to any readers of this forum who recoil from academic debates, this might get mildly theoretical and even more mildly methodological. Concerning international wars, one version of the “nuclear-peace” theory is not in fact laid to rest by the data. It is certainly true that nuclear-armed states have been involved in many wars. They have even been attacked (think of Israel), which falsifies the simple claim of “assured destruction”—that any nuclear country A will deter any kind of attack by any country B because B fears a retaliatory nuclear strike from A. But the most important “nuclear-peace” claim has been about mutually assured destruction, which obtains between two robustly nuclear-armed states. The claim is that (1) rational states having second-strike capabilities—enough deliverable nuclear weaponry to survive a nuclear first strike by an enemy—will have an overwhelming incentive not to attack one another; and (2) we can safely assume that nuclear-armed states are rational. It follows that states with a second-strike capability will not fight one another. Their colossal atomic arsenals neither kept the United States at peace with North Vietnam during the Cold War nor the Soviet Union at peace with Afghanistan. But the argument remains strong that those arsenals did help keep the United States and Soviet Union at peace with each other. Why non-nuclear states are not deterred from fighting nuclear states is an important and open question. But in a time when calls to ban the Bomb are being heard from more and more quarters, we must be clear about precisely what the broad trends toward peace can and cannot tell us. They may tell us nothing about why we have had no World War III, and little about the wisdom of banning the Bomb now. Regarding the downward trend in international war, Professor Mack is friendlier to more palatable theories such as the “democratic peace” (democracies do not fight one another, and the proportion of democracies has increased, hence less war); the interdependence or “commercial peace” (states with extensive economic ties find it irrational to fight one another, and interdependence has increased, hence less war); and the notion that people around the world are more anti-war than their forebears were. Concerning the downward trend in civil wars, he favors theories of economic growth (where commerce is enriching enough people, violence is less appealing—a logic similar to that of the “commercial peace” thesis that applies among nations) and the end of the Cold War (which end reduced superpower support for rival rebel factions in so many Third-World countries). These are all plausible mechanisms for peace. What is more, none of them excludes any other; all could be working toward the same end. That would be somewhat puzzling, however. Is the world just lucky these days? How is it that an array of peace-inducing factors happens to be working coincidentally in our time, when such a magical array was absent in the past? The answer may be that one or more of these mechanisms reinforces some of the others, or perhaps some of them are mutually reinforcing. Some scholars, for example, have been focusing on whether economic growth might support democracy and vice versa, and whether both might support international cooperation, including to end civil wars. We would still need to explain how this charmed circle of causes got started, however. And here let me raise another factor, perhaps even less appealing than the “nuclear peace” thesis, at least outside of the United States. That factor is what international relations scholars call hegemony—specifically American hegemony. A theory that many regard as discredited, but that refuses to go away, is called hegemonic stability theory. The theory emerged in the 1970s in the realm of international political economy. It asserts that for the global economy to remain open—for countries to keep barriers to trade and investment low—one powerful country must take the lead. Depending on the theorist we consult, “taking the lead” entails paying for global public goods (keeping the sea lanes open, providing liquidity to the international economy), coercion (threatening to raise trade barriers or withdraw military protection from countries that cheat on the rules), or both. The theory is skeptical that international cooperation in economic matters can emerge or endure absent a hegemon. The distastefulness of such claims is self-evident: they imply that it is good for everyone the world over if one country has more wealth and power than others. More precisely, they imply that it has been good for the world that the United States has been so predominant. There is no obvious reason why hegemonic stability theory could not apply to other areas of international cooperation, including in security affairs, human rights, international law, peacekeeping (UN or otherwise), and so on. What I want to suggest here—suggest, not test—is that American hegemony might just be a deep cause of the steady decline of political deaths in the world. How could that be? After all, the report states that United States is the third most war-prone country since 1945. Many of the deaths depicted in Figure 10.4 were in wars that involved the United States (the Vietnam War being the leading one). Notwithstanding politicians’ claims to the contrary, a candid look at U.S. foreign policy reveals that the country is as ruthlessly self-interested as any other great power in history. The answer is that U.S. hegemony might just be a deeper cause of the proximate causes outlined by Professor Mack. Consider economic growth and openness to foreign trade and investment, which (so say some theories) render violence irrational. American power and policies may be responsible for these in two related ways. First, at least since the 1940s Washington has prodded other countries to embrace the market capitalism that entails economic openness and produces sustainable economic growth. The United States promotes capitalism for selfish reasons, of course: its own domestic system depends upon growth, which in turn depends upon the efficiency gains from economic interaction with foreign countries, and the more the better. During the Cold War most of its allies accepted some degree of market-driven growth. Second, the U.S.-led western victory in the Cold War damaged the credibility of alternative paths to development—communism and import-substituting industrialization being the two leading ones—and left market capitalism the best model. The end of the Cold War also involved an end to the billions of rubles in Soviet material support for regimes that tried to make these alternative models work. (It also, as Professor Mack notes, eliminated the superpowers’ incentives to feed civil violence in the Third World.) What we call globalization **is** caused in part by the emergence of the United States as the global hegemon. The same case can be made, with somewhat more difficulty, concerning the spread of democracy. Washington has supported democracy only under certain conditions—the chief one being the absence of a popular anti-American movement in the target state—but those conditions have become much more widespread following the collapse of communism. Thus in the 1980s the Reagan administration—the most anti-communist government America ever had—began to dump America’s old dictator friends, starting in the Philippines. Today Islamists tend to be anti-American, and so the Obama administration is skittish about democracy in Egypt and other authoritarian Muslim countries. But general U.S. material and moral support for liberal democracy remains strong.

#### Aff solves—

#### Status quo guarantees collapse of space leadership—new exploration initiatives powered by plutonium are key

Hoover et al ‘9

WILLIAM W. HOOVER, U.S. Air Force (retired), Co-Chair RALPH L. McNUTT, JR., Johns Hopkins University, Applied Physics Laboratory, Co-Chair DOUGLAS M. ALLEN, Schafer Corporation SAMIM ANGHAIE, University of Florida, Gainesville RETA F. BEEBE, New Mexico State University WARREN W. BUCK, University of Washington, Seattle BEVERLY A. COOK, Jet Propulsion Laboratory SERGIO B. GUARRO, The Aerospace Corporation ROGER D. LAUNIUS, Smithsonian Institution FRANK B. McDONALD, University of Maryland, College Park ALAN R. NEWHOUSE, Independent Consultant, Hollywood, Maryland JOSEPH A. SHOLTIS, JR., Sholtis Engineering and Safety Consulting SPENCER R. TITLEY, University of Arizona, Tucson EMANUEL TWARD, Northrop Grumman Space Technology EARL WAHLQUIST, U.S. Department of Energy (retired) Staff ALAN C. ANGLEMAN, Study Director, Aeronautics and Space Engineering Board DWAYNE A. DAY, Program Officer, Space Studies Board SARAH M. CAPOTE, Program Associate, Aeronautics and Space Engineering Board (through November 2008) CELESTE A. NAYLOR, Senior Program Assistant, Space Studies Board (from November 2008 through January 2009) ANDREA M. REBHOLZ, Program Associate, Aeronautics and Space Engineering Board (from February 2009), “Radioisotope Power Systems: An Imperative for Maintaining U.S. Leadership in Space Exploration,” <http://www.lpi.usra.edu/leag/documents/12653.pdf>

Note: RPS = Radio-isotope Power System

ASRG = Advanced Sterling Radioisotope Generator

Through an investment of considerable resources—engineering and scientific knowledge, human capital, and public funds—the United States has gained undisputed leadership in the exploration of the solar system. This has been made possible since the 1950s by harnessing several core technologies that have enabled the U.S. scientific spacecraft to travel for years on end, engage in extended scientific observations, and relay critical data back to Earth. RPSs are one such technology. RPSs convert the heat generated by the natural decay of radioactive material (specifically, 238Pu) to electrical energy. In a radioisotope thermoelectric generator (RTG), the heat flows through the thermocouples to a heat sink, generating direct current (dc) electricity in the process. The thermocouples are then connected through a closed loop that feeds an electrical current to the power management system of the spacecraft. All of the RPSs flown to date have been RTGs. They are compact, rugged, and extraordinarily reliable, but the energy conversion efficiency is low (~6 percent). ASRGs will have much higher efficiency (~29 percent), thereby greatly reducing the amount of 238Pu needed to support future missions. In the Stirling engine converter used by ASRGs, helium gas oscillates in a regenerator, one end of which is heated by radioactive decay of 238Pu, while the other end is cooled by a heat sink. This oscillating gas pushes a piston in a linear alternator that generates alternating current (ac) electricity. The ac is converted to dc electronically, and the current is fed to the power management system of the spacecraft. Although dynamic energy conversion systems have long been considered for RPSs, only recently have technological advances—and the need to minimize future demand for 238Pu—justified development of RPSs with a Stirling engine. RPSs can provide power for multi-year missions to faraway places where sunlight is either lacking (e.g., missions beyond Jupiter) or where solar power is unreliable (e.g., in Jupiter’s radiation belts).1 At Jupiter, sunlight is 96 percent less intense than at Earth. Continuing outward to Pluto, sunlight is 99.94 percent less intense. RPS-powered Voyager, Galileo,Cassini, and New Horizons spacecraft have enabled the United States to explore every planet in this dark, outer region of the solar system. Much of their success has been due in large part to having a reliable power source that provides enough power to operate complex instruments at a data rate high enough to optimize the capabilities of the scientific instruments they carry. RPSs are also useful for missions to the surface of the Moon (especially during the long, cold lunar nights and in the permanently shadowed regions near the lunar poles), for missions to the surface of Mars (with its dust storms and extended winters), for extended missions below Venus’s cloud-deck, and for other missions where solar power is not practical, for example, because the dynamic range of solar power would preclude the use of solar arrays.2 Space nuclear power reactors are another potential option for missions where solar power is not practical. However, the performance and reliability of space nuclear power reactor systems using current technology remains unproven, especially for missions with long lifetimes. In addition, the committee is not aware of any substantive effort currently underway anywhere in the world to develop space nuclear power reactor systems. The history of space nuclear power reactors suggests that space nuclear reactors, if successfully developed, could meet the needs of some missions and could enable other missions that are not now under consideration because of power limitations. For example, Project Prometheus, which was NASA’s most recent attempt to develop space nuclear power reactors, selected a nuclear electric propulsion reactor concept that was scalable from 20 kWe to 300 kWe. However, history also shows that the development of a high-power, long-life space nuclear power reactor would be very time-consuming and cost billions of dollars (see Appendix E) Since 1961, the U.S. has launched 45 RPSs on 26 spacecraft dedicated to navigation, meteorology, communications, and exploration of the Moon, Sun, Mars, Jupiter, Saturn, and elsewhere in the outer solar system (see Table 2-1). This critical work could not have been accomplished without RPSs. Current RPS-powered space missions include the Cassini spacecraft, with three RPSs, which is studying Saturn and its moons; and the New Horizons spacecraft, with one RPS, which is studying Pluto and the Kuiper Belt. The Mars Science Laboratory spacecraft is scheduled for launch in 2011 with an RPS-powered rover. Over the longer term, RPSs are expected to support continued exploration of extreme environments of the Moon, Mars, and Venus, as well as the dimly lit outer reaches of the solar system and beyond. Such missions will be severely constrained or eliminated unless RPSs are ready and available.

#### Deep space missions access perception of leadership

AIA ’12

(Aerospace Industry Association, “Continued U.S. Leadership in Deep Space Exploration Depends on Restarting Plutonium Fuel Production”, 2012, http://www.aia-aerospace.org/assets/2012%20AIA%20Pu-238%20White%20Paper%20-%20SC%20FINAL.pdf)

The United States has a proud history of success with deep space science missions to destinations like Jupiter, Saturn, and the outersolar system. U.S. robotic missions to deep space have provided bold demonstrations of U.S. technological prowess and global competitiveness. Such missions have fundamentally altered our understanding of the solar system and the universe. Amazing imagery from these deep space missions has inspired children at a very early age to pursue careers in science, technology, and mathematics. Deep space missions require a kind of power generator fueled by non-weapons grade plutonium-238. Unfortunately, the U.S. ability to power missions that continue this track record of astounding success could literally run out of fuel. There is no technically feasible near term alternative to plutonium-238 powered generators for deep space missions. Most of these missions travel too far from the sun to receive adequate light for solar panelsystems used on other kinds of spacecraft. Even missions to the inner planets and the Moon may need plutonium-238 generators, due to the lack of constant sunlight on planetary surfaces. For years, the United States has relied on Russia as a source of plutonium-238. Today, Russia no longer exports plutonium238 to the United States, and the U.S. government must now produce its own supply to power upcoming U.S. deep space missions. From the start of production, a full five years of steady annual investment is needed to yield sufficient plutonium for a deep space mission. In a world where other nations are rapidly advancing their own space capabilities, stagnation in plutonium-238 production could be incredibly costly to U.S. space leadership.

#### It ensures cooperative frameworks

Friedman ‘11

Lou recently stepped down after 30 years as Executive Director of The Planetary Society. He continues as Director of the Society's LightSail Program and remains involved in space programs and policy. Before co-founding the Society with Carl Sagan and Bruce Murray, Lou was a Navigation and Mission Analysis Engineer and Manager of Advanced Projects at JPL,, The Space Review, “American leadership,” http://www.thespacereview.com/article/1778/1

American Leadership” is a phrase we hear bandied about a lot in political circles in the United States, as well as in many space policy discussions. It has many different meanings, most derived from cultural or political biases, some of them contradictory. The term sometimes arouses antipathy from non-Americans and from advocates of international cooperation. They may find it synonymous with American hubris or hegemony. It is true that American leadership can be used as a nationalistic call to advance American interests at the expense of non-American interests. But more often it may be used as an international call for promoting mutual interests and cooperation. That is certainly true in space, as demonstrated by the International Space Station, Cassini-Huygens, the James Webb Space Telescope, the Europa Jupiter System Mission, Mars 2016/2018 and Earth observing satellites. These are great existing and proposed missions, which engage much of the world and advance the interests of the US and other nations, inspire the public, and promote cooperation among technical and scientific communities worldwide. Yet space exploration and development are often overlooked in foreign relations and geopolitical strategies. Sometimes, the connection between space exploration and foreign relations has even been belittled in the space community. I refer to the NASA administrator’s foray into the Middle East last year, promoting science, math, and technology as a way to reach out to Muslim nations. It is true that he used some unfortunate wording, such as “foremost purpose,” but it was great that the administration wanted the space program to be part of its overarching international efforts to engaging the Muslim community in peaceful pursuits. Apollo and the International Space Station were both accomplishments motivated more by international and geopolitical interests than they were by space enthusiasm. It’s my view that space ventures should be used to advance American engagement in the world. (For example, with China on the space station and Russia in Mars Sample Return.) American leadership in space is much more desired that resented—except when it gets used unilaterally, as in the past Administration’s call for “dominance in cislunar space.” Asian countries (China, Japan, India) are especially interested in lunar landings; Western countries, including the US, much less so. However, cooperating with Asian countries in lunar science and utilization would be both a sign of American leadership and of practical benefit to US national interests. Apollo 11 astronaut Buzz Aldrin has been a leader advocating such cooperation. At the same time American leadership can be extended by leading spacefaring nations into the solar system with robotic and human expeditions to other worlds.

#### Cooperative frameworks solve weaponization

Rendleman and Faulconer ‘10

\*retired USAF Colonel AND President of Strategic Space Solutions, over 31 years in the aerospace industry, James and Walter, “Improving international space cooperation: Considerations for the USA,” Space Policy 26 (2010) 143-151, Science Direct

For thousands of years, tribes, then cities, states, and nations, have formed cooperative agreements, partnerships and relationships with others to promote matters of mutual interest, such as security and self defense, commerce, and humanitarian assistance. Cooperation presents an opportunity to develop dependencies among nations that may obviate conﬂict. Such sharing also gives a nation an opportunity to gain what may be a rare insight into what a competitor or adversary knows about space technologies and how they can be employed. This understanding can help reduce the need to prepare for doomsday scenarios where one imagines or projects the technologies that an adversary could develop, regardless of the technical merit or reality. Today, international cooperation extends to a whole host of scientiﬁc endeavors, reﬂecting the best spirit and intentions of the Outer Space Treaty, whose preamble calls for space to be used for “peaceful purposes.” 19 This has been the hope since the beginnings of the space era. In 1955, before the very ﬁrst successful space launches, cooperation was declared a centerpiece of US foreign policy strategy when the White House announced: The President has approved plans by this country for going ahead with launching of small unmanned earth-circling satellites as part of the United States participation in the International Geophysical .This program will for the ﬁrst time in history enable scientists throughout the world to make sustained observations in the regions beyond the earth’s atmosphere.20 The full realization of cooperation’s promise occurred nearly four decades later with the end of the Cold War. Space and Earth science research and space exploration were no longer constrained by an overarching competition between two superpowers. Capitalizing on opportunities and leveraging the expertise of other nations, those seeking to jumpstart or advance their scientiﬁc initiatives rushed into the new multi-polar world creating a surplus of international space alliances and partnerships.21 The USA is continuing this trend by reaching out more constructively to large nuclear global powers like India and China, in the hope that such engagement shapes their future space and engineering activities in positive directions.

#### Brink is now

Dinerman 2/11/13

Taylor, a senior editor at the Gatestone Institute in New York. He is also a well-known and respected space writer regarding military and civilian space activities since 1983. From 1999 until 2003, Mr. Dinerman ran Space Equity.com. Taylor Dinerman has now been writing for a variety of publications including Ad Astra, The Wall Street Journal and the American Spectator. He was a regular contributor with a weekly piece for Jeff Foust's Space Review. Mr. Dinerman’s articles on a wide range of important space topics can be read at www.thespacereview.com. His work also appears in the Wall Street Journal, the National Review, and he was the author fo the text book, "Space Sciences for Students." He is a part-time consultant for the US Defense Department, “Proliferating military space power in 2013 and beyond,” http://www.thespacereview.com/article/2236/1

There have been reports that China may be preparing a new test of an anti-satellite weapon, or as some sources claim, a missile defense test disguised as an anti-satellite test. In any case China has the capacity to shoot a satellite out of the sky. Would they use such a capacity against Japan’s space assets? In the near term it’s highly unlikely, but for the Beijing government the mere threat is a useful way to force the Japanese and the Americans to take their capability into consideration. The China-Japan confrontation is just one example of the way that military space forces are now integrated into just about every single actual or potential war that is taking place on our planet. From Israel versus Iran to South Sudan versus Sudan to the ongoing India-Pakistan tensions or even the confused, nasty, and largely ignored fighting in the Eastern Congo, space forces play an essential role. Warfare in space, or from Earth to orbit, is also a new fact of life. Already there have been reliable reports that some space systems are being jammed. A few years ago Iran made an effort to interfere with US broadcasting satellites from a base in Cuba. China has reportedly fired lasers at US spy satellites. The US has tested so-called “counterspace systems” that can jam target satellites in low Earth orbit. Primitive space weapons are available to any nation that can put a payload into orbit. It’s only a small step from these supposedly “non-destructive” systems to active space weapons. Governments that thrive on confrontation, such as North Korea, now have every incentive to use their space launch capability to attack the space assets of their enemies. If this does happen, it will present interesting problems for nations like the US that make extensive use of space for military and economic reasons. Since no one would be killed in such an attack, would it be an act of war requiring a violent response? Would a limited diplomatic or economic response just look weak?

#### Space Leadership is key to successful space law

Maniscalcoy et al ‘9

Matthew P., Aerospace Systems Engineer, with Noel M. Bakhtian and Alan H. Zorn – Ph.D. Candidates at Stanford University, “The Eighth Continent: A Vision for Exploration of the Moon and Beyond,” American Institute of Aeronautics and Astronautics, AIAA Space 2009 Conference and Exposition, September 2009)

International considerations include preventative politics and global cooperation. With space law currently in its infancy, the prevailing treaties and various agreements will need to be extensively augmented in the coming years, and major players on the space stage may well have influence in shaping laws governing the future of all things space-related. Of significant import are issues relating to the militarization of space, ownership and use of \land" and resources, and protection of the space environment. The United Nations Committee on the Peaceful Uses of Outer Space created five treaties and agreements between 1967 and 1984 which constitute the majority of the body of space laws in place today. According to the Committee: \the international legal principles in these five treaties provide for non-appropriation of outer space by any one country, arms control, the freedom of exploration, ..., the prevention of harmful interference with space activities and the environment, the notification and registration of ... the exploitation of natural resources in outer space and the settlement of disputes."44 However, many nations have chosen not to ratify the treaties, meaning that these regulations have not been universally accepted. Imminent lunar and martian exploration by a few countries implies a need for current space laws to be globally ratified and the inception of supplementary treaties or agreements as the need arises. Future amendments or treaties might lean towards favoring those countries at the leading edge in space activities, the effects of which might have unpredictable negative consequences for the prosperity, influence, and safety of those countries who are not.

#### Space leadership solves space debris.

Newton and Griffin ’11

(Elizabeth and Michael, director for Space Policy in the Center for System Studies at the University of Alabama in Huntsville, former strategist at NASA Marshall Space Flight Center, AND physicist and space engineer, former Administrator of NASA, eminent scholar and professor of mechanical and aerospace engineering at the University of Alabama in Huntsville Space Policy, “United States space policy and international partnership” ScienceDirect)

As stated in the White House’s space policy and Lynn’s preview of the National Security Space Strategy, US security hinges on fostering a cooperative, predictable space environment where countries can operate in a stable, sustainable way. Planned debris tracking standards, considerations of international ‘rules of the road’, and shared data sets for collision avoidance and debris mitigation are measures that undoubtedly will contribute to the security of space as a shared venue for national activities. The stated desire to develop a Combined Space Operations Center for coalition operations could expand access to information, awareness, and services. Leveraging partner capabilities, integrating them into system architectures, and increasing the interoperability of systems are important planned steps as well. These new strategies do not diminish the USA’s current strengths in the national security space realm and quite likely stand to capitalize on international interest in multilateral solutions. Further information will doubtless be forthcoming in the Space Posture Review.

#### PU-238 generation funding key to signal re-commitment to science leadership

AIA ’12

(Aerospace Industry Association, “Continued U.S. Leadership in Deep Space Exploration Depends on Restarting Plutonium Fuel Production”, 2012, http://www.aia-aerospace.org/assets/2012%20AIA%20Pu-238%20White%20Paper%20-%20SC%20FINAL.pdf)

Plutonium-238 has been an excellent source of electric power for U.S. deep space missions. The fuel itself cannot be used in a warhead – it is wholly for peaceful purposes. This type of electric power generator has an excellent safety and reliability record, proven time and again on numerous successful deep space missions. Never has a U.S. plutonium-powered generator compromised the safety of bystanders or professional personnel, nor have they ever threatened to damage property during any phase of their usage – fabrication, preparation, launch, or flight. Re-starting production of plutonium-238 in the United States requires only a relatively small investment of $20 million a year by the U.S. government. The Department of Energy (DOE), which had previously handled the U.S.supply of plutonium-238 for NASA, agreed to split the $20 million annual production cost with NASA. In fiscal year 2012, NASA was funded $10 million to restart plutonium-238 production in the United States. Congress however, did not appropriate funds from the DOE as agreed upon by the agencies in fiscal year 2012, and the program was left without adequate funds to begin production. It has been estimated that the U.S. has only enough plutonium-238 for one more flagship deep space planetary mission before the U.S. supply completely runs out. Without a U.S. plutonium-238 supply, all U.S. deep space missions could be grounded for the foreseeable future. AIA is deeply concerned that the U.S. government cannot produce an adequate supply of plutonium-238 for its deep space missions. Each year that the plutonium-238 production program is not funded the full $20 million, is potentially another year lost for deep space exploration. While missions to date have explored the planets of the solar system, only now are we beginning to investigate the outer solar system bodies containing primordial material that can help us understand the origin of the solar system. The outer solar system is also where comets originate – icy bodies that have sometimes collided with our world. Further gaps in plutonium-238 production could translate into national losses of technical capability and expertise for important deep space power generators. The need to keep up the pace of cutting-edge science and technology is clear. Many other countries are quickly advancing their capabilities to similarly conduct scientific exploration of the solar system and beyond. Steadily funding U.S. government plutonium-238 production now and in the years to come is a key enabler of future U.S. scientific leadership at minimal cost. By making this smart but meager investment, the U.S. government can ensure the future of U.S. exploration and discovery is bright.

#### Science leadership locks in US hegemony

Coletta ‘9

Damon, Duke University , Ph.D. in Political Science, December 1999 Harvard University , Master in Public Policy, 1993 Stanford University, Master in Electrical Engineering, 1989 Stanford University , B.S.E.E., 1988 “Science, Technology, and the Quest for International Influence,” http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA536133&Location=U2&doc=GetTRDoc.pdf

To discover sustainable hegemony in an increasingly multipolar world, American policy makers will need more than the Kaysen list of advantages from basic science. Dr. Carl Kaysen served President John Kennedy as deputy national security adviser and over his long career held distinguished professorships in Political Economy at Harvard and MIT. During the 1960s, Kaysen laid out a framework with four important reasons why a great power, the United States in particular, should take a strategic interest in the basic sciences. 1. Scientific discoveries provided the input for applied research, which in turn produced technologies crucial for wielding economic and military power. 2. Scientific activity educated a cadre of operators for leadership in industries relevant to government such as health care and defense. 3. Science proficiency generated the raw elements for mounting focused, applied efforts such as the Manhattan Project during World War II to build the first atomic bomb. 4. Scientific progress built a basic research reserve that when necessary could move quickly to shore up national needs.1 These arguments underscored science‘s contribution to new products and services that provided market or military advantages. The pursuit of physics, chemistry, and biology at the frontiers of knowledge could have direct effects on national excellence. The following sections of this article extend Kaysen‘s list for the present multi-polar world. The United States‘ largest military and economic shares in such a world do not guarantee empire. Soft power from scientific achievement, however, may make up part of the deficit, enough to augment America‘s reputation and American leadership in the international order. The U.S. science establishment is then described and evaluated for its capacity to integrate and leverage the complete list of science benefits: Kaysen‘s nation-based items plus the civilization-based advantages exposited here. Case studies of the Office of Naval Research and U.S. scientific outreach to Brazil illustrate underlying strengths and weaknesses of the U.S. system for maintaining the lead in basic science. Among the weaknesses, democratic regimes tend to suffocate professions, particularly in the sciences, due to natural hostility between democracy and technocracy. The United States might yet find the right balance by inculcating a politically sophisticated professionalism. In other areas of heavy government responsibility—finance, health care, foreign intelligence, and defense—officials and the public have over time placed considerable trust in expert agents. With greater scientific literacy at the mass level and greater political literacy at the scientific level, America‘s state and society may forge a somewhat freer, healthier relationship with American science, accruing benefits for U.S. material power in the long run and, in the short run, for persuasive influence in the international system. Science and International Leadership In their book on Leading Sectors and World Powers (1996), George Modelski and William Thompson extended their analysis of innovation back, beyond the birth of industrial capitalism, to the Sung Dynasty in China at the turn of the First Millennium.2 Modelski and Thompson mentioned inventions like the compass that helped leaders extract wealth from maritime East-West trade routes, but they also noted the Sung rulers‘ cultivation of knowledge and the influence of Chinese intellectuals on administrative reform. A scientific society has the opportunity to apply methods and models toward political and economic questions. Just before the November 2008 elections, the New York Times’ David Ignatius sat down with two former national security advisers, Zbigniew Brzezinski and Brent Scowcroft, for a series of interviews on foreign policy.3 In their discussion of complementary strengths that could lay the groundwork for greater transatlantic cooperation, the advisers noted how impressive it was that the European Union could knit together so many independent states with sophisticated, comprehensive rules and regulations without inadvertently strangling economic growth. It seems improbable that Europe could build the administrative structures for a successful common currency or a single labor market without an ethos that came from scientific competence. Progress in the physical sciences can spill over in a way that supports modern institutions and efficient public policy. Spillover to social sciences reinforces the notion that scientific progress and scientific literacy are civilizing influences. As such they can fortify what Joseph Nye termed a country‘s soft power, its capacity to establish appealing precedents for the rest of the world.4 Science shares properties with Olympic sport in that it can open avenues for non-coercive cultural hegemony. Foreign emulation in science, though, counts for more than soccer or gymnastics. The demonstration effect in physics may initially appear as man-overcoming-Nature rather than man-versusman, but great scientific advance is more cumulative than victory in the Games. Anyone seeking to take the next step must accommodate the vernacular of the pioneer and accept his tutelage in the universal logic governing scientific concepts. Moreover, the ingenuity and skills on display as a citizen in a specific nation-state, albeit working at university, unlocks another secret of nature register around the world as excellence that could someday be harnessed by government and adapted to the state-versus-state context. That fungibility garners international respect and piques interest in greater collaboration. In his study of American science overtures to Europe during the first decades of the Cold War, John Krige related how overlapping interests and in some instances the overlapping community of scientists and government officials infused pure science aid with foreign policy purpose. The construction of CERN (Conseil Européen pour la Recherche Nucléaire) for all-European particle research in Geneva. European conferences of the well-connected Ford Foundation and the development of the NATO Science Committee did not simply advance basic knowledge; they also nurtured a special dialogue, unencumbered by normal diplomatic preoccupations. This privileged communication nevertheless facilitated American hegemony and buttressed Western solidarity against intimidation, or alternate offers, from the Soviet Union. In material balance of power terms, the larger economy and more capable nuclear forces of the United States were seen as less threatening to Western Europe than the Red Army, deployed just over the makeshift border with East Germany.5 Cultural appeal, including scientific prowess as well as liberal democratic ideals, afforded the United States extra diplomatic margin as it simultaneously expanded its own arsenal and its alliances against a technically inferior opponent. Finally, during the late-Cold War, after 1970, the economic rise of Germany and Japan, the larger diplomatic role of China, and the greater international participation from post-colonial governments in the developing world reshaped the global agenda. Problems traditionally managed by the great powers— arms control, arms proliferation, international development, environmental consequences of industrialization and urbanization—were picked up by non-governmental entities who sought to influence state behavior. Given their small budgets and their status as outside observers rather than diplomats or official negotiators, specialized knowledge was their instrument of choice. As transportation and communication technologies improved through the 1980s and 1990s, issue-based groups and public policy institutes proliferated, combining with academic researchers to build epistemic communities.

## Missions

#### Contention two is missions—

#### Extinction is inevitable—

#### Polarity reversal

**Turchin ‘8**

Alexei, PhD in Physics, “Structure of the Global Catastrophe: Risks of human extinction in the XXI Century”, 2008, <http://www.scribd.com/doc/6250354/STRUCTURE-OF-THE-GLOBAL-CATASTROPHE-Risks-of-human-extinction-in-the-XXI-century-#outer_page_51>

Polarity reversal of the magnetic field of the Earth We live in the period of easing and probably polarity reversal of the magnetic field of the Earth. In itself inversion of a magnetic field will not result in extinction of people as polarity reversal already repeatedly occurred in the past without appreciable harm. In the process of polarity reversal the magnetic field could fall to zero or to be orientated toward Sun (pole will be on equator) which would lead to intense “suck” of charged particles into the atmosphere. The simultaneous combination of three factors - falling to zero of the magnetic field of the Earth, exhaustion of the ozone layer and strong solar flash could result in death of all life on Earth, or: at least, to crash of all electric systems that is fraught with falling of a technological civilisation. And itself this crash is not terrible, but is terrible what will be in its process with the nuclear weapon and all other technologies. Nevertheless the magnetic field decreases slowly enough (though speed of process accrues) so hardly it will be nulled in the nearest decades. Other catastrophic scenario -magnetic field change is connected with changes of streams of magma in the core, that somehow can influence global volcanic activity (there are data on correlation of the periods of activity and the periods of change of poles). The third risk - possible wrong understanding of the reasons of existence of a magnetic field of the Earth.

#### Gamma ray bursts

**Turchin, 08**

(Alexei, PhD in Physics, “Structure of the Global Catastrophe: Risks of human extinction in the XXI Century”, 2008, <http://www.scribd.com/doc/6250354/STRUCTURE-OF-THE-GLOBAL-CATASTROPHE-Risks-of-human-extinction-in-the-XXI-century-#outer_page_51>

Gamma ray bursts are intensive short streams of gamma radiation coming from far space. Gamma ray bursts, apparently, are radiated in the form of narrow bunches, and consequently their energy more concentrated, than at usual explosions of stars. Probably, strong gamma ray bursts from close sources have served as the reasons of several mass extinctions tens and hundred millions years ago. It is supposed, that gamma ray bursts occur at collisions of black holes and neutron stars or collapses of massive stars. Close gamma ray bursts could cause destruction of an ozone layer and even atmosphere ionisation. However in the nearest environment of the Earth there is no visible suitablecandidates neither on sources of gamma ray bursts, nor for supernovas (the nearestcandidate for a gamma ray burst source, a star Eta Carinae - it is far enough - an order of 7000 light years and hardly its axis of inevitable explosion in the future will be directed tothe Earth - Gamma ray bursts extend in a kind narrow beam jets; However at a potentialstar-hypernew of star WR 104 which are on almost at same distance, the axis is directedalmost towards the Earth. This star will blow up during nearest several hundreds thousand years that means chance of catastrophe with it in the XXI century less than 0.1 %, and withthe account of uncertainty of its parametres of rotation and our knowledge about scale -splashes - and is even less). Therefore, even with the account of effect of observantselection, which increases frequency of catastrophes in the future in comparison with thepast in some cases up to 10 times (see my article « Antropic principle and Naturalcatastrophes») the probability of dangerous gamma ray burst in the XXI century does not exceed thousand shares of percent. Mankind can survive even serious gamma ray burst invarious bunkers. Estimating risk of gamma ray bursts, Boris Stern writes: «We take amoderate case of energy relies of 10 \*\* 52 erg and distance to splash 3 parsec, 10 lightyears, or 10 \*\* 19 sm - in such limits from us are tens stars. On such distance for few seconds on each square centimetre of a planet got on ways of gamma ray will be allocated 10 \*\* 13 erg. It is equivalent to explosion of a nuclear bomb on each hectare of the sky! Atmosphere does not help: though energy will be highlighted in its top layers, the considerable part will instantly reach a surface in the form of light. Clearly, that all live on half of planet will be instantly exterminated, on second half hardly later at the expense of secondary effects. Even if we take in 100 times bigger distance (it a thickness of a galacticdisk and hundred thousand stars), the effect (on a nuclear bomb on a square with the partyof 10 km) will be the hard strike, and here already it is necessary to estimate seriously -what will survive and whether something will survive in general». Stern believes, that gamma ray burst in Our galaxy happens on the average time in one million years. Gamma ray burst in such star as WR 104, can cause intensive destruction of the ozone layer onhalf of planet. Probably, Gamma ray burst became reason of Ordovician mass extinction 443 million years ago when 60 % of kinds of live beings (and it is considerable the bigshare on number of individuals as for a survival of a specie there is enough preservation of only several individuals) were lost. According to John Scalo and Craig Wheeler, gamma raybursts make essential impact on biosphere of our planet approximately everyone five millions years. Even far gamma ray burst or other high-energy space event can be dangerous by radiation hurt of the Earth - and not only direct radiation which atmosphere appreciably blocks (but avalanches of high-energy particles from cosmic rays reach a terrestrial surface), but also for the formation account in atmosphere of radioactive atoms, that will result in the scenario similar described in connection with cobalt bomb. Besides, the scale radiation causes oxidation of nitrogen of atmosphere creating opaque poisonous gas –dioxide of nitrogen which is formed in an upper atmosphere and can block a sunlight and cause a new Ice age. There is a hypothesis, that neutrino radiation arising at explosions of supernovas can lead in some cases to mass extinction as neutrino is elastic dissipate onheavy atoms with higher probability, and energy of this dispersion is sufficient for infringement of chemical bonds, and therefore neutrino will cause more often DNAdamages, than other kinds of radiation having much bigger energy. (J.I.Collar. BiologicalEffects of Stellar Collapse Neutrinos. Phys.Rev.Lett. 76 (1996) 999-1002<http://arxiv.org/abs/astro-ph/9505028>) Danger of gamma ray burst is in its suddenness - it begins without warning from invisible sources and extends with a velocity of light. In any case, gamma ray burst can amaze only one hemisphere of the Earth as they last only a few seconds or minutes.Activization of the core of galaxy (where there is a huge black hole) is too veryimprobable event. In far young galaxies such cores actively absorb substance which twists at falling in accretion disk and intensively radiates. This radiation is very powerful and also can interfere with life emerging on planets. However the core of our galaxy is very great and consequently can absorb stars almost at once, not breaking off them on a part, so,with smaller radiation. Besides, it is quite observed in infra-red beams (a source theSagittarius), but is closed by a thick dust layer in an optical range, and near to the blackhole there is no considerable quantity of the substance ready to absorption by it, - only onestar in an orbit with the period in 5 years, but also it can fly still very long. And the mainthing, it is very far from Solar system. Except distant gamma ray bursts, there are the soft Gamma ray bursts connectedwith catastrophic processes on special neutron stars - magnitars. On August, 27th, 1998flash on magnitar has led to instant decrease in height of an ionosphere of the Earth on 30km, however this magnitar was on distance of 20 000 light years. Magnitars in vicinities of the Earth are unknown, but find out them it can not to be simple.Our estimation of probability of dangerous gamma ray bursts can be (and can and notto be) is seriously deformed by action of effect of observtion selection in the spirit of antropic principle; moreover, the effect of "pent-up demand" here can affect - that is thosestars which "have postponed" (more precisely, we observe them such in force of antropicprinciple) the Gamma ray burst for the intelligent life on the Earth could emerge, now cancarry out it. (There are assumptions, that the life in the Universe is extremely rare, because the overwhelming majority of planets is sterilised by gamma ray bursts.)

#### Comets will hit the earth—guarantees extinction—asteroid defense doesn’t apply

**Roach ‘3**

(John, National Geographic, "Comets: How Big A Threat To Earth?", Jan 28, news.nationalgeographic.com/news/pf/29750780.html

Earth-bound asteroids grab newspaper headlines for good reason. Scientists say the fallout of an asteroid several city blocks wide smacking into the planet would be catastrophic. Mass extinctions, runaway infernos, erratic climate fluctuations, and devastating impacts on human civilization are just some of the scenarios imagined. Why, then, does the threat of a comet impact with Earth—potentially as dire if not worse than an asteroid—rarely leak onto the pages of the popular press? "Primarily because the rate of comet impacts on Earth is not as great as the rate of asteroid impacts," said Daniel Durda, a senior research scientist at the Southwest Research Institute in Boulder, Colorado. Most comets, and potentially some asteroids, have orbits that bring them close to Earth only once every 200 years or longer. Such bodies are known to astronomers as long-period objects. The rate of long-period comet impacts on Earth is on the order of one every 32 million years, whereas the rate of comparably-sized asteroid impacts is more like one per every 500,000 years. "When—note that I do not say if—we find a comet which has some potential to hit Earth, it might cause an even bigger sensation than potential asteroid impactors," said Robert Jedicke, an asteroid expert at the University of Arizona in Tucson. The Threat The consequences of comet and asteroid impacts on Earth are roughly comparable. Both would cause widespread destruction and loss of human life, said Jedicke. "Big chunks of rock with a little ice, an asteroid, or big chunks of ice with a little rock, a comet, create a lot of damage when they impact Earth," he said. "[It's] like getting hit on the head by a stone with an icy coating or an iceball with a lot of rock in it—it's going to hurt your head." A key difference is that long-period objects, like comets, will impact Earth with much greater speed than short-period objects, said Dan Mazanek, an engineer at NASA's Langley Research Center in Hampton, Virginia. "If we happen to come across a long-period object that is dense, it would not have to be large to produce the same kinetic energy of a one-kilometer [0.6-mile] near-Earth asteroid," he said. "To me, that seems like something worthwhile to investigate." Consider this example. An asteroid 0.6 mile (1 kilometer) wide with a density of 187 pounds per cubic foot (3,000 kilograms per cubic meter) traveling at 12 miles per second (20 kilometers per second) would impact Earth with a force approximately 15 times greater than the world's total nuclear arsenal. A comet of just over half the size and one-third the mass traveling at 37 miles (60 kilometers) per second could achieve an impact of similar force if it were to strike Earth. "Size matters," said Mazanek. "But so does density and speed." Protection Some astronomers are working to safeguard the Earth from potential impact by comets or other near-Earth objects in orbit around the Sun. The Near-Earth Object Program at NASA's Jet Propulsion Laboratory in Pasadena, California, coordinates the study of these objects. As near-Earth objects are detected, scientists perform calculations on their orbits to determine if or when they pose a threat to impact Earth. The hope is that astronomers can detect all near-Earth objects decades before they would potentially impact Earth. Meanwhile, other scientists are busy trying to figure out how to throw such threatening objects off course, thus mitigating the pending doom. Long-period objects like comets, however, are not easily detected until they enter the solar system. "A long-period object by definition may not have any records of sightings in written history," said Mazanek. "If it came back into the solar system and it was on [an Earth-bound trajectory], we would not have much warning." Mazanek leads NASA's Comet/Asteroid Protect System, a program that would expand on the Near-Earth Object Program to include the detection of long-period comets, as well as small asteroids and short-period comets that pose an Earth impact threat. The space-based system, not to be in place for at least 25 years, would provide constant monitoring and a system to divert and modify the orbits of threatening objects. Confirmation of a long-period object on an impact trajectory would be possible at least a year before impact, allowing more time to take defensive action than current detection systems allow. The problem is that not much could be done if a long-period object on an Earth-bound trajectory were detected today, said Durda. "The worst scenario I can think of is a multi-kilometer-diameter, long-period comet discovered several months out on an impact trajectory as it is entering the inner solar system," he said. "There is absolutely nothing we could do about it at this point in time. Nothing."

#### **Mars colonization solves human extinction**

Schulze-Makuch and Davies ’10

(Dirk Schulze-Makuch, professor of earth and environmental science and theoretical physicist Ph.D., and Paul Davies, Ph.D., School of Earth and Environmental Sciences, Washington State University and the Beyond Center, Arizona State University, Journal of Cosmology, October-November 2010, Vol 12, 3619-3626)

There are several reasons that motivate the establishment of a permanent Mars colony. We are a vulnerable species living in a part of the galaxy where cosmic events such as major asteroid and comet impacts and supernova explosions pose a significant threat to life on Earth, especially to human life. There are also more immediate threats to our culture, if not our survival as a species. These include global pandemics, nuclear or biological warfare, runaway global warming, sudden ecological collapse and supervolcanoes (Rees 2004). Thus, the colonization of other worlds is a must if the human species is to survive for the long term. The first potential colonization targets would be asteroids, the Moon and Mars. The Moon is the closest object and does provide some shelter (e.g., lava tube caves), but in all other respects falls short compared to the variety of resources available on Mars. The latter is true for asteroids as well. Mars is by far the most promising for sustained colonization and development, because it is similar in many respects to Earth and, crucially, possesses a moderate surface gravity, an atmosphere, abundant water and carbon dioxide, together with a range of essential minerals. Mars is our second closest planetary neighbor (after Venus) and a trip to Mars at the most favorable launch option takes about six months with current chemical rocket technology. In addition to offering humanity a "lifeboat" in the event of a mega-catastrophe, a Mars colony is attractive for other reasons. Astrobiologists agree that there is a fair probability that Mars hosts, or once hosted, microbial life, perhaps deep beneath the surface (Lederberg and Sagan 1962; Levin 2010; Levin and Straat 1977, 1981; McKay and Stoker 1989; McKay et al. 1996; Baker et al. 2005; Schulze-Makuch et al. 2005, 2008, Darling and Schulze-Makuch 2010; Wierzchos et al. 2010; Mahaney and Dohm 2010). A scientific facility on Mars might therefore be a unique opportunity to study an alien life form and a second evolutionary record, and to develop novel biotechnology therefrom. At the very least, an intensive study of ancient and modern Mars will cast important light on the origin of life on Earth. Mars also conceals a wealth of geological and astronomical data that is almost impossible to access from Earth using robotic probes. A permanent human presence on Mars would open the way to comparative planetology on a scale unimagined by any former generation. In the fullness of time, a Mars base would offer a springboard for human/robotic exploration of the outer solar system and the asteroid belt. Finally, establishing a permanent multicultural and multinational human presence on another world would have major beneficial political and social implications for Earth, and serve as a strong unifying and uplifting theme for all humanity.

#### Prioritize avoiding existential risk.

Bostrom 11

Nick Bostrom, Professor in the Faculty of Philosophy & Oxford Martin School, Director of the Future of Humanity Institute, and Director of the Programme on the Impacts of Future Technology at the University of Oxford, recipient of the 2009 Eugene R. Gannon Award for the Continued Pursuit of Human Advancement, holds a Ph.D. in Philosophy from the London School of Economics, 2011 (“Existential Risk: The most important task for all humanity” Draft of a Paper published on ExistentialRisk.com, <http://www.existential-risk.org/concept.html>)AS

But even this reflection fails to bring out the seriousness of existential risk. What makes existential catastrophes especially bad is not that they would show up robustly on a plot like the one in figure 3, causing a precipitous drop in world population or average quality of life. Instead, their significance lies primarily in the fact that they would destroy the future. The philosopher Derek Parfit made a similar point with the following thought experiment: I believe that if we destroy mankind, as we now can, this outcome will be *much* worse than most people think. Compare three outcomes: (1) **Peace.** (2) **A nuclear** **war that kills 99%** of the world’s existing population. (3) **A nuclear war that kills 100%.** (2) would be worse than (1), and (3) would be worse than (2). Which is the greater of these two differences? Most people believe that the greater difference is between (1) and (2). **I believe that the difference between (2) and (3) is *very much* greater.** … The Earth will remain habitable for at least another billion years. Civilization began only a few thousand years ago. If we do not destroy mankind, these few thousand years may be only a tiny fraction of the whole of civilized human history. The difference between (2) and (3) may thus be the difference between this tiny fraction and all of the rest of this history. If we compare this possible history to a day, what has occurred so far is only a fraction of a second. (10: 453-454) To calculate the loss associated with an existential catastrophe, we must consider how much value would come to exist in its absence. **It turns out that the ultimate potential for Earth-originating intelligent life is literally astronomical**. One gets a large number even if one confines one’s consideration to the potential for biological human beings living on Earth. If we suppose with Parfit that our planet will remain habitable for at least another billion years, and we assume that at least one billion people could live on it sustainably, then the potential exist for at least 1018 human lives. These lives could also be considerably better than the average contemporary human life, which is so often marred by disease, poverty, injustice, and various biological limitations that could be partly overcome through continuing technological and moral progress. However, the relevant figure is not how many people could live on Earth but how many descendants we could have in total. One lower bound of the number of biological human life-years in the future accessible universe (based on current cosmological estimates) is 1034 years.[[7]](http://www.existential-risk.org/concept.html#_ftn7) Another estimate, which assumes that future minds will be mainly implemented in computational hardware instead of biological neuronal wetware, produces a lower bound of 1054 human-brain-emulation subjective life-years (or 1071 basic computational operations).(4)[[8]](http://www.existential-risk.org/concept.html#_ftn8) If we make the less conservative assumption that future civilizations could eventually press close to the absolute bounds of known physics (using some as yet unimagined technology), we get radically higher estimates of the amount of computation and memory storage that is achievable and thus of the number of years of subjective experience that could be realized.[[9]](http://www.existential-risk.org/concept.html#_ftn9) Even if we use the most conservative of these estimates, which entirely ignores the possibility of space colonization and software minds, we find that the expected loss of an existential catastrophe is greater than the value of 1018 human lives. This implies that the expected value of reducing existential risk by a mere *one millionth of one percentage point* is at least ten times the value of a billion human lives. The more technologically comprehensive estimate of 1054 human-brain-emulation subjective life-years (or 1052 lives of ordinary length) makes the same point even more starkly. **Even if we give this allegedly lower bound on the cumulative output potential of a technologically mature civilization a mere 1% chance of being correct, we find that the expected value of reducing existential risk by a mere *one billionth of one billionth of one percentage point* is worth a hundred billion times as much as a billion human lives**. One might consequently argue that even the tiniest reduction of existential risk has an expected value greater than that of the definite provision of any “ordinary” good, such as the direct benefit of saving 1 billion lives. And, further, that the absolute value of the *indirect* effect of saving 1 billion lives on the total cumulative amount of existential risk—positive or negative—is almost certainly larger than the positive value of the direct benefit of such an action.[[10]](http://www.existential-risk.org/concept.html#_ftn10)

#### Global water scarcity’s inevitable–causes war and kills billions

Nitish Priyadarshi 12, lecturer in the department of environment and water management at Ranchi University in India, “War for water is not a far cry”, June 16, <http://www.cleangangaportal.org/node/44>

The battles of yesterday were fought over land. Those of today are over energy. But the battles of tomorrow may be over water. Along with population growth and increasing per capita water consumption, massive pollution of the world's surface water systems has placed a great strain on remaining supplies of clean fresh water. Global deforestation, destruction of wetlands, dumping of pesticides and fertilizer into waterways, and global warming are all taking a terrible toll on the Earth's fragile water system. The combination of increasing demand and shrinking supply has attracted the interest of global corporations who want to sell water for a profit. The water industry is touted by the World Bank as a potential trillion-dollar industry. Water has become the “blue gold” of the 21st century. In many parts of the world, one major river supplies water to multiple countries. Climate change, pollution and population growth are putting a significant strain on supplies. In some areas renewable water reserves are in danger of dropping below the 500 cubic meters per person per year considered a minimum for a functioning society. In recent times, several studies around the globe show that climatic change is likely to impact significantly upon freshwater resources availability. In India, demand for water has already increased manifold over the years due to urbanization, agriculture expansion, increasing population, rapid industrialization and economic development. At present, changes in cropping pattern and land-use pattern, over-exploitation of water storage and changes in irrigation and drainage are modifying the hydrological cycle in many climate regions and river basins of India. Due to warming and climate change rainfall trend has been badly affected worldwide. This change has adversely affected the groundwater recharge. Water scarcity is expected to become an even more important problem than it is today. In a case study of Jharkhand state of India groundwater recharging is mainly dependent on rainfall. Though Jharkhand receives sufficient amount of rainfall (900 to 1400 mm/year) but from last several years the rainfall pattern is very erratic. From last two years Ranchi city the capital of Jharkhand state received sufficient rainfall but distribution of rainfall was not uniform. It rained heavily just for two to three days in the month of August and September which resulted in heavy runoff and less infiltration affecting groundwater level. The process of urbanization and industrialization from last 20 years has caused changes in the water table of Jharkhand State of India as a result of decreased recharge and increased withdrawal. Many of the small ponds which were main source of water in the surrounding areas are now filled for different construction purpose affecting the water table. By 2100, water scarcity could impact between 1.1 and 3.2 billion people, says a leaked draft of an Intergovernmental Panel on Climate Change (IPCC) report due to be published in April 2007. The report focuses on the consequences of global warming and options for adapting to them. In February 2007 the panel released a report on the scientific basis of climate change. The IPCC predicts critical water shortages in China and Australia, as well as parts of Europe and the United States. Africa and poor countries such as Bangladesh would be most affected because they were least able to cope with drought. Major cities worldwide may face a water shortage crisis by 2050 if relevant governments don't react quickly. The water shortage will mostly affect basic daily needs such as drinking, cooking, bathing and washing clothes, and the poor residents of the world's major cities in developing countries are the ones who will suffer most. "By 2050, big cities that will not have enough water available nearby include Beijing, New Delhi, Mexico City, Lagos and Tehran. China and India will be particularly hard hit unless significant new efforts are taken by their cities,". There are several principal manifestations of the water crisis. 1. Inadequate access to safe drinking water for about 884 million people. 2. Inadequate access to water for sanitation and waste disposal for 2.5 billion people. 3. Groundwater over drafting (excessive use) leading to diminished agricultural yields. 4. Overuse and pollution of water resources harming biodiversity. 5. Regional conflicts over scarce water resources sometimes resulting in warfare. Potential Hot Spots: Egypt: A coalition led by Ethiopia is challenging old agreements that allow Egypt to use more than 50 percent of the Nile’s flow. Without the river, all of Egypt would be desert. Eastern Europe: Decades of pollution have fouled the Danube, leaving down-stream countries, such as Hungary and the Republic of Moldova, scrambling to find new sources of water. Middle East: The Jordan River, racked by drought and diverted by Israeli, Syrian and the Jordanian dams, has lost 95 percent of its former flow. Former Soviet Union: The Aral sea, at one time the world’s fourth largest inland sea, has lost 75 percent of its water because of diversion programs begun in the 1960s. There are many other countries of the world that are severely impacted with regard to human health and inadequate drinking water. The following is a partial list of some of the countries with significant populations (numerical population of affected population listed) whose only consumption is of contaminated water:  Sudan: 12.3 million  Venezuela: 5.0 million  Ethiopia: 2.7 million  Tunisia: 2.1 million  Cuba :1.3 million

#### Intensifies every conflict—extinction

Reilly ‘2

(Kristie, Editor for In These Times, a nonprofit, independent, national magazine published in Chicago. We’ve been around since 1976, fighting for corporate accountability and progressive government. In other words, a better world, “NOT A DROP TO DRINK,” <http://www.inthesetimes.com/issue/26/25/culture1.shtml>)

\*Cites environmental thinker and activist Vandana Shiva Maude Barlow and Tony Clarke—probably North America’s foremost water experts

The two books provide a chilling, in-depth examination of a rapidly emerging global crisis. “Quite simply,” Barlow and Clarke write, “unless we dramatically change our ways, between one-half and two-thirds of humanity will be living with severe fresh water shortages within the next quarter-century. … The hard news is this: Humanity is depleting, diverting and polluting the planet’s fresh water resources so quickly and relentlessly that every species on earth—including our own—is in mortal danger.” The crisis is so great, the three authors agree, that the world’s next great wars will be over water. The Middle East, parts of Africa, China, Russia, parts of the United States and several other areas are already struggling to equitably share water resources. Many conflicts over water are not even recognized as such: Shiva blames the Israeli-Palestinian conflict in part on the severe scarcity of water in settlement areas. As available fresh water on the planet decreases, today’s low-level conflicts can only increase in intensity.

#### That solves indo-pak water wars that go nuclear.

Zahoor ‘11

(Musharaf, is researcher at Department of Nuclear Politics, National Defence University, Islamabad, “Water crisis can trigger nuclear war in South Asia,” <http://www.siasat.pk/forum/showthread.php?77008-Water-Crisis-can-Trigger-Nuclear-War-in-South-Asia>, AM)

South Asia is among one of those regions where water needs are growing disproportionately to its availability. The high increase in population besides large-scale cultivation has turned South Asia into a water scarce region. The two nuclear neighbors Pakistan and India share the waters of Indus Basin. All the major rivers stem from the Himalyan region and pass through Kashmir down to the planes of Punjab and Sindh empty into Arabic ocean. It is pertinent that the strategic importance of Kashmir, a source of all major rivers, for Pakistan and symbolic importance of Kashmir for India are maximum list positions. Both the countries have fought two major wars in 1948, 1965 and a limited war in Kargil specifically on the Kashmir dispute. Among other issues, the newly born states fell into water sharing dispute right after their partition. Initially under an agreed formula, Pakistan paid for the river waters to India, which is an upper riparian state. After a decade long negotiations, both the states signed Indus Water Treaty in 1960. Under the treaty, India was given an exclusive right of three eastern rivers Sutlej, Bias and Ravi while Pakistan was given the right of three Western Rivers, Indus, Chenab and Jhelum. The tributaries of these rivers are also considered their part under the treaty. It was assumed that the treaty had permanently resolved the water issue, which proved a nightmare in the latter course. India by exploiting the provisions of IWT started wanton construction of dams on Pakistani rivers thus scaling down the water availability to Pakistan (a lower riparian state). The treaty only allows run of the river hydropower projects and does not permit to construct such water reservoirs on Pakistani rivers, which may affect the water flow to the low lying areas. According to the statistics of Hydel power Development Corporation of Indian Occupied Kashmir, India has a plan to construct 310 small, medium and large dams in the territory. India has already started work on 62 dams in the first phase. The cumulative dead and live storage of these dams will be so great that India can easily manipulate the water of Pakistani rivers. India has set up a department called the Chenab Valley Power Projects to construct power plants on the Chenab River in occupied Kashmir. India is also constructing three major hydro-power projects on Indus River which include Nimoo Bazgo power project, Dumkhar project and Chutak project. On the other hand, it has started Kishan Ganga hydropower project by diverting the waters of Neelum River, a tributary of the Jhelum, in sheer violation of the IWT. The gratuitous construction of dams by India has created serious water shortages in Pakistan. The construction of Kishan Ganga dam will turn the Neelum valley, which is located in Azad Kashmir into a barren land. The water shortage will not only affect the cultivation but it has serious social, political and economic ramifications for Pakistan. The farmer associations have already started protests in Southern Punjab and Sindh against the non-availability of water. These protests are so far limited and under control. The reports of international organizations suggest that the water availability in Pakistan will reduce further in the coming years. If the situation remains unchanged, the violent mobs of villagers across the country will be a major law and order challenge for the government. The water shortage has also created mistrust among the federative units, which is evident from the fact that the President and the Prime Minister had to intervene for convincing Sindh and Punjab provinces on water sharing formula. The Indus River System Authority (IRSA) is responsible for distribution of water among the provinces but in the current situation it has also lost its credibility. The provinces often accuse each other of water theft. In the given circumstances, Pakistan desperately wants to talk on water issue with India. The meetings between Indus Water Commissioners of Pakistan and India have so far yielded no tangible results. The recent meeting in Lahore has also ended without concrete results. India is continuously using delaying tactics to under pressure Pakistan. The Indus Water Commissioners are supposed to resolve the issues bilaterally through talks. The success of their meetings can be measured from the fact that Pakistan has to knock at international court of arbitration for the settlement of Kishan Ganga hydropower project. The recently held foreign minister level talks between both the countries ended inconclusively in Islamabad, which only resulted in heightening the mistrust and suspicions. The water stress in Pakistan is increasing day by day. The construction of dams will not only cause damage to the agriculture sector but India can manipulate the river water to create inundations in Pakistan. The rivers in Pakistan are also vital for defense during wartime. The control over the water will provide an edge to India during war with Pakistan. The failure of diplomacy, manipulation of IWT provisions by India and growing water scarcity in Pakistan and its social, political and economic repercussions for the country can lead both the countries toward a war. The existent A-symmetry between the conventional forces of both the countries will compel the weaker side to use nuclear weapons to prevent the opponent from taking any advantage of the situation. Pakistan's nuclear programme is aimed at to create minimum credible deterrence. India has a declared nuclear doctrine which intends to retaliate massively in case of first strike by its' enemy. In 2003, India expanded the operational parameters for its nuclear doctrine. Under the new parameters, it will not only use nuclear weapons against a nuclear strike but will also use nuclear weapons against a nuclear strike on Indian forces anywhere. Pakistan has a draft nuclear doctrine, which consists on the statements of high ups. Describing the nuclear thresh-hold in January 2002, General Khalid Kidwai, the head of Pakistan's Strategic Plans Division, in an interview to Landau Network, said that Pakistan will use nuclear weapons in case India occupies large parts of its territory, economic strangling by India, political disruption and if India destroys Pakistan's forces. The analysis of the ambitious nuclear doctrines of both the countries clearly points out that any military confrontation in the region can result in a nuclear catastrophe. The rivers flowing from Kashmir are Pakistan's lifeline, which are essential for the livelihood of 170 million people of the country and the cohesion of federative units. The failure of dialogue will leave no option but to achieve the ends through military means.

#### Water scarcity causes Middle East war

Nitish Priyadarshi 12, lecturer in the department of environment and water management at Ranchi University in India, “War for water is not a far cry”, June 16, <http://www.cleangangaportal.org/node/44>

The crisis over water in the Middle East is escalating. Despite existing agreements, dwindling resources – increasingly affected by pollution, agricultural/industrial initiatives and population growth – have elevated the strategic importance of water in the region. For Middle Eastern nations, many already treading the razor’s edge of conflict, water is becoming a catalyst for confrontation – an issue of national security and foreign policy as well as domestic stability. Given water’s growing ability to redefine interstate relations, the success of future efforts to address water sharing and distribution will hinge upon political and strategic approaches to this diminishing natural resource. In the Middle East, water resources are plummeting. While representing 5% of the total world population, the Middle East & North Africa (MENA) region contains only 0.9% of global water resources.1 The number of water-scarce countries in the Middle East and North Africa has risen from 3 in 1955 (Bahrain, Jordan and Kuwait) to 11 by 1990 (with the inclusion of Algeria, Israel and the Occupied Territories, Qatar, Saudi Arabia, Somalia, Tunisia, the United Arab Emirates and Yemen). Another 7 are anticipated to join the list by 2025 (Egypt, Ethiopia, Iran, Libya, Morocco, Oman and Syria). In addition to its scarcity, much of Middle Eastern water stems from three major waterways: the Tigris-Euphrates, Nile and Jordan River systems. Mutual reliance on these resources has made water a catalyst for conflict, spurring confrontations such as the 1967 War (fomented by Syria’s attempts to divert water from Israel) and the Iran-Iraq War (which erupted from disputes over water claims and availability). Recognition of water’s role as an obstacle in interstate relations has spurred numerous attempts at resolution, including diplomatic efforts (most notably the 1953-1955 U.S.-brokered Johnston negotiations) and bilateral and multilateral treaty efforts, ranging from the 1959 Agreement for the Full Utilization of Nile Waters to the 1994 Israeli-Jordanian Treaty. Along the Tigris and Euphrates Rivers, Turkey and Syria are currently approaching a massive confrontation over water resources. Relations between the two countries, strained at best, have been exacerbated since the 1980s by growing tensions over water, which have brought them to the brink of war several times. The Jordan River Basin has also emerged as a flashpoint for conflict over water. Resources in the area, suffering serious overuse as a result of pollution and population growth, have increasingly impacted interstate relations. Between Jordan and Israel, water resource issues are reaching a fever pitch. Despite the 1994 Israeli-Jordanian Treaty – which established comprehensive guidelines regulating the distribution, preservation and availability of water from the Jordan and Yarmouk Rivers – conflicts over water have risen to the forefront of relations between the two countries. Jordan, fed only by underground sources and the Jordan River, has experienced an escalating water deficit – one that is expected to reach 250 million cubic meters (nearly 1/3rd of current annual consumption) by 2010. At the same time, Israel – currently utilizing almost all available water from its National Water System (consisting of the West Bank Mountain Aquifer, the Coastal Aquifer and the Lake Kinneret Basin) – has been forced to resort to overexploitation of available resources for expanding agricultural and industrial ventures. As a result, water has become a critical bone of contention between the two countries. The historically troubled relations between Israel and the Palestinians have also been magnified by water. Mutual reliance on the West Bank Mountain Aquifer, which rests atop the demarcating border of the disputed West Bank territory (and currently provides 1/3rd of Israel’s water supply and 80% of Palestinian consumption), has created friction between the State of Israel and the Palestinian Authority.

#### Nuclear war

James A. **Russell,** Senior Lecturer, National Security Affairs, Naval Postgraduate School, ‘9 (Spring) “Strategic Stability Reconsidered: Prospects for Escalation and Nuclear War in the Middle East” IFRI, Proliferation Papers, #26, http://www.ifri.org/downloads/PP26\_Russell\_2009.pdf

Strategic stability in the region is thus undermined by various factors: (1) asymmetric interests in the bargaining framework that can introduce unpredictable behavior from actors; (2) the presence of non-state actors that introduce unpredictability into relationships between the antagonists; (3) incompatible assumptions about the structure of the deterrent relationship that makes the bargaining framework strategically unstable; (4) perceptions by Israel and the United States that its window of opportunity for military action is closing, which could prompt a preventive attack; (5) the prospect that Iran’s response to pre-emptive attacks could involve unconventional weapons, which could prompt escalation by Israel and/or the United States; (6) the lack of a communications framework to build trust and cooperation among framework participants. These systemic weaknesses in the coercive bargaining framework all suggest that escalation by any the parties could happen either on purpose or as a result of miscalculation or the pressures of wartime circumstance. Given these factors, it is disturbingly easy to imagine scenarios under which a conflict could quickly escalate in which the regional antagonists would consider the use of chemical, biological, or nuclear weapons. It would be a mistake to believe the nuclear taboo can somehow magically keep nuclear weapons from being used in the context of an unstable strategic framework. Systemic asymmetries between actors in fact suggest a certain increase in the probability of war – a war in which escalation could happen quickly and from a variety of participants. Once such a war starts, events would likely develop a momentum all their own and decision-making would consequently be shaped in unpredictable ways. The international community must take this possibility seriously, and muster every tool at its disposal to prevent such an outcome, which would be an unprecedented disaster for the peoples of the region, with substantial risk for the entire world.

#### Lack of Pu-238 production collapses all decadal survey missions.

Squyres et al ’12

(Chair of the Planetary Science Decadal Survey, Steering Group STEVEN W. SQUYRES, Cornell University, Chair LAURENCE A. SODERBLOM, U.S. Geological Survey, Vice Chair WENDY M. CALVIN, University of Nevada, Reno DALE CRUIKSHANK, NASA Ames Research Center PASCALE EHRENFREUND, George Washington University G. SCOTT HUBBARD, Stanford University WESLEY T. HUNTRESS, JR., Carnegie Institution of Washington (retired) (until November 2009) MARGARET G. KIVELSON, University of California, Los Angeles B. GENTRY LEE, NASA Jet Propulsion Laboratory JANE LUU, Massachusetts Institute of Technology, Lincoln Laboratory STEPHEN MACKWELL, Lunar and Planetary Institute RALPH L. McNUTT, JR., Johns Hopkins University, Applied Physics Laboratory HARRY Y. McSWEEN, JR., University of Tennessee, Knoxville GEORGE A. PAULIKAS, The Aerospace Corporation (retired) (from January 2010) AMY SIMON-MILLER, NASA Goddard Space Flight Center DAVID J. STEVENSON, California Institute of Technology A. THOMAS YOUNG, Lockheed Martin Corporation (retired) Inner Planets Panel ELLEN R. STOFAN, Proxemy Research, Inc., Chair STEPHEN MACKWELL, Lunar and Planetary Institute, Vice Chair BARBARA A. COHEN, NASA Marshall Space Flight Center MARTHA S. GILMORE, Wesleyan University LORI GLAZE, NASA Goddard Space Flight Center DAVID H. GRINSPOON, Denver Museum of Nature and Science STEVEN A. HAUCK II, Case Western Reserve University AYANNA M. HOWARD, Georgia Institute of Technology CHARLES K. SHEARER, University of New Mexico DOUGLAS S. STETSON, Space Science and Exploration Consulting Group EDWARD M. STOLPER, California Institute of Technology ALLAN H. TREIMAN, Lunar and Planetary Institute Mars Panel PHILIP R. CHRISTENSEN, Arizona State University, Chair WENDY M. CALVIN, University of Nevada, Reno, Vice Chair RAYMOND E. ARVIDSON, Washington University ROBERT D. BRAUN, Georgia Institute of Technology (until February 2010) GLENN E. CUNNINGHAM, Jet Propulsion Laboratory (retired) DAVID DES MARAIS, NASA Ames Research Center (until August 2010) LINDA T. ELKINS-TANTON, Massachusetts Institute of Technology FRANCOIS FORGET, Université de Paris 6 JOHN P. GROTZINGER, California Institute of Technology PENELOPE KING, University of New Mexico PHILIPPE LOGNONNE, Institut de Physique du Globe de Paris PAUL R. MAHAFFY, NASA Goddard Space Flight Center LISA M. PRATT, Indiana University Giant Planets Panel HEIDI B. HAMMEL, Association of Universities for Research in Astronomy, Inc., Chair AMY SIMON-MILLER, NASA Goddard Space Flight Center, Vice Chair RETA F. BEEBE, New Mexico State University JOHN R. CASANI, Jet Propulsion Laboratory JOHN CLARKE, Boston University BRIGETTE HESMAN, University of Maryland WILLIAM B. HUBBARD, University of Arizona MARK S. MARLEY, NASA Ames Research Center PHILIP D. NICHOLSON, Cornell University R. WAYNE RICHIE, NASA Langley Research Center (retired) KUNIO M. SAYANAGI, California Institute of Technology Satellites Panel JOHN SPENCER, Southwest Research Institute, Boulder, Chair DAVID J. STEVENSON, California Institute of Technology, Vice Chair GLENN FOUNTAIN, Johns Hopkins University, Applied Physics Laboratory CAITLIN ANN GRIFFITH, University of Arizona KRISHAN KHURANA, University of California, Los Angeles CHRISTOPHER P. McKAY, NASA Ames Research Center FRANCIS NIMMO, University of California, Santa Cruz LOUISE M. PROCKTER, Johns Hopkins University, Applied Physics Laboratory GERALD SCHUBERT, University of California, Los Angeles THOMAS R. SPILKER, NASA Jet Propulsion Laboratory ELIZABETH P. TURTLE, Johns Hopkins University, Applied Physics Laboratory J. HUNTER WAITE, JR., Southwest Research Institute, San Antonio Primitive Bodies Panel JOSEPH F. VEVERKA, Cornell University, Chair HARRY Y. McSWEEN, JR., University of Tennessee, Knoxville, Vice Chair ERIK ASPHAUG, University of California, Santa Cruz MICHAEL E. BROWN, California Institute of Technology DONALD E. BROWNLEE, University of Washington MARC BUIE, Southwest Research Institute, Boulder TIMOTHY J. McCOY, Smithsonian Institution, National Museum of Natural History MARC D. RAYMAN, NASA Jet Propulsion Laboratory EDWARD REYNOLDS, Johns Hopkins University, Applied Physics Laboratory MARK SEPHTON, Imperial College London JESSICA SUNSHINE, University of Maryland FAITH VILAS, Planetary Science InstituteCopyright © National Academy of Sciences. All rights reserved. Vision and Voyages for Planetary Science in the Decade 2013-2022 vii Staff DAVID H. SMITH, Senior Program Officer, Study Director DWAYNE DAY, Senior Program Officer ABIGAIL SHEFFER, Associate Program Officer CATHERINE A. GRUBER, Editor DIONNA WILLIAMS, Program Associate LEWIS GROSWALD, Research Associate RODNEY HOWARD, Senior Program Assistant ELENA AMADOR, Lloyd V. Berkner Space Policy Intern (2009) GABRIELE BETANCOURT-MARTINEZ, Lloyd V. Berkner Space Policy Intern (2010) JORDAN BOCK, Lloyd V. Berkner Space Policy Intern (2009) DARA FISHER, Lloyd V. Berkner Space Policy Intern (2010) ABIGAIL FRAEMAN, Space Policy Intern (2009) ANDREAS FRICK, Lloyd V. Berkner Space Policy Intern (2010) ANGIE WOLFGANG, Lloyd V. Berkner Space Policy Intern (2009) MICHAEL H. MOLONEY, Director, Space Studies Board, Vision and Voyages for Planetary Science in the Decade 2013-2022, The National Academies Press, 2012, <http://science.nasa.gov/media/medialibrary/2012/08/29/Planetary_DS.pdf>

Radioisotope power systems are necessary for powering spacecraft at large distances from the Sun; in the extreme radiation environment of the inner Galilean satellites; in the low light levels of high martian latitudes, dust storms, and night; for extended operations on the surface of Venus; and during the long lunar night. With some 50 years of technology development and use of 46 such systems on 26 previous and currently flying spacecraft, the technology, safe handling, and utility of these units are not in doubt. Of the more than 3,000 nuclides, plutonium-238 stands out as the safest and easiest to procure isotope for use on robotic spacecraft. This report’s recommended missions cannot be carried out without new plutonium-238 production or com- pleted deliveries from Russia. There are no technical alternatives to plutonium-238, and the longer the restart of production is delayed, the more it will cost. The committee is alarmed at the limited availability of plutonium-238 for planetary exploration. Without a restart of domestic production of plutonium-238, it will be impossible for the United States, or any other country, to conduct certain important types of planetary missions after this decade.

#### That means no Mars sample return or JEO

Squyres et al ’12

(Chair of the Planetary Science Decadal Survey, Steering Group STEVEN W. SQUYRES, Cornell University, Chair LAURENCE A. SODERBLOM, U.S. Geological Survey, Vice Chair WENDY M. CALVIN, University of Nevada, Reno DALE CRUIKSHANK, NASA Ames Research Center PASCALE EHRENFREUND, George Washington University G. SCOTT HUBBARD, Stanford University WESLEY T. HUNTRESS, JR., Carnegie Institution of Washington (retired) (until November 2009) MARGARET G. KIVELSON, University of California, Los Angeles B. GENTRY LEE, NASA Jet Propulsion Laboratory JANE LUU, Massachusetts Institute of Technology, Lincoln Laboratory STEPHEN MACKWELL, Lunar and Planetary Institute RALPH L. McNUTT, JR., Johns Hopkins University, Applied Physics Laboratory HARRY Y. McSWEEN, JR., University of Tennessee, Knoxville GEORGE A. PAULIKAS, The Aerospace Corporation (retired) (from January 2010) AMY SIMON-MILLER, NASA Goddard Space Flight Center DAVID J. STEVENSON, California Institute of Technology A. THOMAS YOUNG, Lockheed Martin Corporation (retired) Inner Planets Panel ELLEN R. STOFAN, Proxemy Research, Inc., Chair STEPHEN MACKWELL, Lunar and Planetary Institute, Vice Chair BARBARA A. COHEN, NASA Marshall Space Flight Center MARTHA S. GILMORE, Wesleyan University LORI GLAZE, NASA Goddard Space Flight Center DAVID H. GRINSPOON, Denver Museum of Nature and Science STEVEN A. HAUCK II, Case Western Reserve University AYANNA M. HOWARD, Georgia Institute of Technology CHARLES K. SHEARER, University of New Mexico DOUGLAS S. STETSON, Space Science and Exploration Consulting Group EDWARD M. STOLPER, California Institute of Technology ALLAN H. TREIMAN, Lunar and Planetary Institute Mars Panel PHILIP R. CHRISTENSEN, Arizona State University, Chair WENDY M. CALVIN, University of Nevada, Reno, Vice Chair RAYMOND E. ARVIDSON, Washington University ROBERT D. BRAUN, Georgia Institute of Technology (until February 2010) GLENN E. CUNNINGHAM, Jet Propulsion Laboratory (retired) DAVID DES MARAIS, NASA Ames Research Center (until August 2010) LINDA T. ELKINS-TANTON, Massachusetts Institute of Technology FRANCOIS FORGET, Université de Paris 6 JOHN P. GROTZINGER, California Institute of Technology PENELOPE KING, University of New Mexico PHILIPPE LOGNONNE, Institut de Physique du Globe de Paris PAUL R. MAHAFFY, NASA Goddard Space Flight Center LISA M. PRATT, Indiana University Giant Planets Panel HEIDI B. HAMMEL, Association of Universities for Research in Astronomy, Inc., Chair AMY SIMON-MILLER, NASA Goddard Space Flight Center, Vice Chair RETA F. BEEBE, New Mexico State University JOHN R. CASANI, Jet Propulsion Laboratory JOHN CLARKE, Boston University BRIGETTE HESMAN, University of Maryland WILLIAM B. HUBBARD, University of Arizona MARK S. MARLEY, NASA Ames Research Center PHILIP D. NICHOLSON, Cornell University R. WAYNE RICHIE, NASA Langley Research Center (retired) KUNIO M. SAYANAGI, California Institute of Technology Satellites Panel JOHN SPENCER, Southwest Research Institute, Boulder, Chair DAVID J. STEVENSON, California Institute of Technology, Vice Chair GLENN FOUNTAIN, Johns Hopkins University, Applied Physics Laboratory CAITLIN ANN GRIFFITH, University of Arizona KRISHAN KHURANA, University of California, Los Angeles CHRISTOPHER P. McKAY, NASA Ames Research Center FRANCIS NIMMO, University of California, Santa Cruz LOUISE M. PROCKTER, Johns Hopkins University, Applied Physics Laboratory GERALD SCHUBERT, University of California, Los Angeles THOMAS R. SPILKER, NASA Jet Propulsion Laboratory ELIZABETH P. TURTLE, Johns Hopkins University, Applied Physics Laboratory J. HUNTER WAITE, JR., Southwest Research Institute, San Antonio Primitive Bodies Panel JOSEPH F. VEVERKA, Cornell University, Chair HARRY Y. McSWEEN, JR., University of Tennessee, Knoxville, Vice Chair ERIK ASPHAUG, University of California, Santa Cruz MICHAEL E. BROWN, California Institute of Technology DONALD E. BROWNLEE, University of Washington MARC BUIE, Southwest Research Institute, Boulder TIMOTHY J. McCOY, Smithsonian Institution, National Museum of Natural History MARC D. RAYMAN, NASA Jet Propulsion Laboratory EDWARD REYNOLDS, Johns Hopkins University, Applied Physics Laboratory MARK SEPHTON, Imperial College London JESSICA SUNSHINE, University of Maryland FAITH VILAS, Planetary Science InstituteCopyright © National Academy of Sciences. All rights reserved. Vision and Voyages for Planetary Science in the Decade 2013-2022 vii Staff DAVID H. SMITH, Senior Program Officer, Study Director DWAYNE DAY, Senior Program Officer ABIGAIL SHEFFER, Associate Program Officer CATHERINE A. GRUBER, Editor DIONNA WILLIAMS, Program Associate LEWIS GROSWALD, Research Associate RODNEY HOWARD, Senior Program Assistant ELENA AMADOR, Lloyd V. Berkner Space Policy Intern (2009) GABRIELE BETANCOURT-MARTINEZ, Lloyd V. Berkner Space Policy Intern (2010) JORDAN BOCK, Lloyd V. Berkner Space Policy Intern (2009) DARA FISHER, Lloyd V. Berkner Space Policy Intern (2010) ABIGAIL FRAEMAN, Space Policy Intern (2009) ANDREAS FRICK, Lloyd V. Berkner Space Policy Intern (2010) ANGIE WOLFGANG, Lloyd V. Berkner Space Policy Intern (2009) MICHAEL H. MOLONEY, Director, Space Studies Board, Vision and Voyages for Planetary Science in the Decade 2013-2022, The National Academies Press, 2012, <http://science.nasa.gov/media/medialibrary/2012/08/29/Planetary_DS.pdf>

The decadal survey has identified five candidate flagship missions for the decade 2013-2022. In alphabetical order, they are as follows: • Enceladus Orbiter—This mission would investigate that saturnian satellite’s cryovolcanic activity, habitability, internal structure, chemistry, geology, and interaction with the other bodies of the Saturn system. • Jupiter Europa Orbiter (JEO)—This mission would characterize Europa’s ocean and interior, ice shell, chemistry and composition, and the geology of prospective landing sites. • Mars Astrobiology Explorer-Cacher (MAX-C)—This mission is the first of the three components of the Mars Sample Return campaign. It is responsible for characterizing a landing site selected for high science potential, and for collecting, documenting, and packaging samples for return to Earth. • Uranus Orbiter and Probe—This mission’s spacecraft would deploy a small probe into the atmosphere of Uranus to make in situ measurements of noble gas abundances and isotopic ratios and would then enter orbit, making remote sensing measurements of the planet’s atmosphere, interior, magnetic field, and rings, as well as multiple flybys of the larger uranian satellites. • Venus Climate Mission—This mission is designed to address science objectives concerning the Venus atmosphere, including carbon dioxide greenhouse effects, dynamics and variability, surface-atmosphere exchange, and origin. The mission architecture includes a carrier spacecraft, a gondola and balloon system, a mini-probe, and two dropsondes.

#### Sample return key to Martian colonization

Carr et al ‘12

The MEPAG-SBAG Precursor Science Analysis Group (Carr, Michael1 ; Abell, Paul2 ; Baker, John3 ; Barnes, Jeff4 ; Bass, Deborah3 ; Beaty, David3 ; Boston, Penny5 ; Brinkerhoff, Will6 ; Budney, Charles3 ; Charles, John7 ; 8 Delory, Greg8 ; Desai, Prasun9 ; Drake, Bret7 ; Hamilton, Vicky15; Head, Jim14; Heldmann, Jen10; Hoffman, Steve7 ; Kass, David3 ; Lim, Darlene10; Meyer, Michael9 ; Munk, Michelle11; Murchie, Scott12; Rivkin, Andy12; Sanders, Gerry7 ; Steele, Andrew16; Wargo, Mike9 ; Zurek, Rich3 ), the MEPAG Executive Committee (Des Marais, David10; Mustard, John14; Johnson, Jeff12; Beaty, David3 ; Hamilton, Victoria; Zurek, Richard3 ; Hinners, Noel13; Meyer, Michael9 ), and the Mars Program Office science team (Allwood, Abigail3 ; Beaty, David3 ; Bass, Deborah3 ) 1 US Geological Survey, USA 2 NASA Johnson Space Center, USA, 3 Jet Propulsion Laboratory, NASA/California Institute of Technology, USA, 5 New Mexico Tech, USA, 6 NASA Goddard Space Flight Center, USA, 7 NASA Johnson Space Center, USA, 8 University of California, Berkeley, USA, 9 NASA Headquarters, 11NASA Langley Research Center, USA, 12Johns Hopkins University, Applied Physics Laboratory, USA, 10NASA Ames Research Center, 13Lockheed Martin, USA, 14Brown University, USA, 15Southwest Research Institute, USA, 16Carnegie Institution of Washington, USA, “IS MARS SAMPLE RETURN REQUIRED PRIOR TO SENDING HUMANS TO MARS?,” http://trs-new.jpl.nasa.gov/dspace/bitstream/2014/42596/1/12-1785.pdf

Prior to potentially sending humans to the surface of Mars, it is fundamentally important to return samples from Mars. Analysis in Earth’s extensive scientific laboratories would significantly reduce the risk of human Mars exploration and would also support the science and engineering decisions relating to the Mars human flight architecture. The importance of measurements of any returned Mars samples range from critical to desirable, and in all cases these samples will would enhance our understanding of the Martian environment before potentially sending humans to that alien locale. For example, Mars sample return (MSR) could yield information that would enable human exploration related to 1) enabling forward and back planetary protection, 2) characterizing properties of Martian materials relevant for in situ resource utilization (ISRU), 3) assessing any toxicity of Martian materials with respect to human health and performance, and 4) identifying information related to engineering surface hazards such as the corrosive effect of the Martian environment. In addition, MSR would be engineering ‘proof of concept’ for a potential round trip human mission to the planet, and a potential model for international Mars exploration.

#### Specifically resolves resource constraints which enable long-duration stays

Carr et al ‘12

The MEPAG-SBAG Precursor Science Analysis Group (Carr, Michael1 ; Abell, Paul2 ; Baker, John3 ; Barnes, Jeff4 ; Bass, Deborah3 ; Beaty, David3 ; Boston, Penny5 ; Brinkerhoff, Will6 ; Budney, Charles3 ; Charles, John7 ; 8 Delory, Greg8 ; Desai, Prasun9 ; Drake, Bret7 ; Hamilton, Vicky15; Head, Jim14; Heldmann, Jen10; Hoffman, Steve7 ; Kass, David3 ; Lim, Darlene10; Meyer, Michael9 ; Munk, Michelle11; Murchie, Scott12; Rivkin, Andy12; Sanders, Gerry7 ; Steele, Andrew16; Wargo, Mike9 ; Zurek, Rich3 ), the MEPAG Executive Committee (Des Marais, David10; Mustard, John14; Johnson, Jeff12; Beaty, David3 ; Hamilton, Victoria; Zurek, Richard3 ; Hinners, Noel13; Meyer, Michael9 ), and the Mars Program Office science team (Allwood, Abigail3 ; Beaty, David3 ; Bass, Deborah3 ) 1 US Geological Survey, USA 2 NASA Johnson Space Center, USA, 3 Jet Propulsion Laboratory, NASA/California Institute of Technology, USA, 5 New Mexico Tech, USA, 6 NASA Goddard Space Flight Center, USA, 7 NASA Johnson Space Center, USA, 8 University of California, Berkeley, USA, 9 NASA Headquarters, 11NASA Langley Research Center, USA, 12Johns Hopkins University, Applied Physics Laboratory, USA, 10NASA Ames Research Center, 13Lockheed Martin, USA, 14Brown University, USA, 15Southwest Research Institute, USA, 16Carnegie Institution of Washington, USA, “IS MARS SAMPLE RETURN REQUIRED PRIOR TO SENDING HUMANS TO MARS?,” http://trs-new.jpl.nasa.gov/dspace/bitstream/2014/42596/1/12-1785.pdf

In situ resource utilization on Mars is considered a high-priority enabling technology for any human exploration as it can significantly reduce the quantity of consumables that require transport from Earth and enable longer duration stays at Mars. For example, oxygen for life support and as an oxidizer for propulsion systems could be recovered from CO2 gas in the atmosphere (10). Another example of ISRU includes the recovery of mission-enabling H2 O for life support and H for propulsion from hydrated minerals and/or shallow, near-surface ice. Return of Martian surface samples to Earth could reduce the technical risk associated with each of these ISRU options. Atmospheric-based ISRU is the highest priority with the Mars human exploration architecture but both the mechanical and chemical properties of dust might interfere chemically with systems that extract O from CO2 from the atmosphere (10). Thus, sample return and characterization of dust like that suspended in the atmosphere would be of high priority. Currently, seasonal cycles of the column abundance of dust (11) and average particle size throughout the column (12) are known with some fidelity. However the full particle size distribution and mechanical properties of the dust are unknown, and its composition is understood only approximately for major phases for dust in the atmosphere and mixed with coarse-grained soil. Also there is little information on minor and trace phases (e.g., 13). The most definitive way to assess whether the martian dust would hinder extraction would be to test the ISRU with samples of dust returned from Mars or with high fidelity simulants designed based on analysis of returned dust. An additional priority would be to return a sample of a hydrated mineral resource. Current orbital mapping reveals locations and some information on volume of mineral deposits with enhanced water content of up to about 8%, or ~5% higher than in background soils (14). The water occurs in a variety of mineral phases including phyllosilicates, sulfates, hydrated silica, and carbonates, sometimes in association with other hydrous or hydroxylated phases. Some of the deposits (clays, carbonates) are chemically neutral whereas others are thought to be acidic (15). There is limited information on minor phases that could affect resource extraction only at one major deposit, e.g., at the Mars Exploration Rover (MER)/Opportunity landing site (13). The mechanical and geotechnical properties of hydrated mineral deposits are highly uncertain, again known in part only at one location (16), and the energy required to extract the H2 O is speculative. In situ investigations (for example, coring/drilling combined with mineralogical and elemental abundance measurements, differential scanning calorimetry / thermal analysis, evolved gas analysis, or gas chromatography / mass spectroscopy) could provide information on mechanical and geotechnical properties, energy requirements for resource extraction, and abundances of major and some minor mineral phases. A returned sample would provide comparable information on geotechnical properties and much more comprehensive information on the chemistry of the material. Given the variability of hydrated mineral resources, the most valuable samples related to ISRU would come from a site of potential human exploration. Near-surface ice is another potential resource both for crew support and for hydrogen as a fuel. The sensitivity of ISRU of ice to factors such as fraction of ice present, the difficulty of mining ice and the effects of contaminants on extraction is unclear.

#### Colonization is possible

**Zubrin ‘10**

Robert, PhD in aerospace engineering, "Human Mars Exploration: The Time Is Now", Oct-Nov 2010, journalofcosmology.com/Mars111.html

4. Killing the Dragons Opponents of human Mars exploration frequently cite several issues which they claim make such missions to dangerous to be considered at this time. Like the dragons that use to mar the maps medieval cartographers, these concerns have served to deter many who otherwise might be willing to enterprise the exploration of the unknown. It is therefore fitting to briefly address them here. 4.1. Radiation: It is alleged by some that the radiation doses involved in a Mars mission present insuperable risks, or are not well understood. This is untrue. Solar flare radiation, consisting of protons with energies of about 1 MeV, can be shielded by 12 cm of water or provisions, and there will be enough of such materials on board the ship to build an adequate pantry storm shelter for use in such an event. The residual cosmic ray dose, about 50 Rem for the 2.5 year mission, represents a statistical cancer risk of about 1%, roughly the same as that which would be induced by an average smoking habit over the same period. 4.2. Zero Gravity: Cosmonauts have experienced marked physiological deterioration after extended exposure to zero gravity. However a Mars mission can be flown employing artificial gravity generated by rotating the spacecraft. The engineering challenges associated with designing either rigid or tethered artificial gravity systems are modest, and make the entire issue of zero-gravity health effects on interplanetary missions moot. 4.3. Back Contamination: Recently some people have raised the issue of possible back-contamination as a reason to shun human (or robotic sample return) missions to Mars. Such fears have no basis in science. The surface of Mars is too cold for liquid water, is exposed to near vacuum, ultra violet, and cosmic radiation, and contains an antiseptic mixture of peroxides that have eliminated any trace of organic material. It is thus as sterile an environment as one could ask for. Furthermore, pathogens are specifically adapted to their hosts. Thus, while there may be life on Mars deep underground, it is quite unlikely that these could be pathogenic to terrestrial plants or animals, as there are no similar macrofauna or macroflora to support a pathogenic life cycle in Martian subsurface groundwater. In any case, the Earth currently receives about 500 kg of Martian meteoritic ejecta per year. The trauma that this material has gone through during its ejection from Mars, interplanetary cruise, and re-entry at Earth is insufficient to have sterilized it, as has been demonstrated experimentally and in space studies on the viability of microorganisms following ejection and reentry (Burchell et al. 2004; Burchella et al. 2001; Horneck et al. 1994, 1995, 2001, Horneck et al. 1993; Mastrapaa et al. 2001; Nicholson et al. 2000). So if there is the Red Death on Mars, we’ve already got it. Those concerned with public health would do much better to address their attentions to Africa. 4.4. Human Factors: In popular media, it is frequently claimed that the isolation and stress associated with a 2.5 year round-trip Mars mission present insuperable difficulties. Upon consideration, there is little reason to believe that this is true. Compared to the stresses dealt with by previous generations of explorers and mariners, soldiers in combat, prisoners in prisons, refugees in hiding, and millions of other randomly selected people, those that will be faced by the hand-picked crew of Mars 1 seem modest. Certainly psychological factors are important (Bishop 2010; Fielder & Harrison, 2010; Harrison & Fielder 2010; Suedfeld 2010). However, any serious reading of previous history indicates that far from being the weak link in the chain of the piloted Mars mission, the human psyche is likely to be the strongest link in the chain as Apollo astronauts have testified (Mitchell & Staretz 2010; Schmitt 2010). 4.5. Dust Storms: Mars has intermittent local, and occasionally global dust storms with wind speeds up to 100 km/hour. Attempting to land through such an event would be a bad idea, and two Soviet probes committed to such a maelstrom by their uncontrollable flight systems were destroyed during landing in 1971. However, once on the ground, Martian dust storms present little hazard. Mars’ atmosphere has only about 1% the density of Earth at sea-level. Thus a wind with a speed of 100 km/hr on Mars only exerts the same dynamic pressure as a 10 km/hr breeze on Earth. The Viking landers endured many such events without damage.

#### Spinoffs from the aff solve water scarcity

Rampelotto 11

Department of Biology, Federal University of Santa Maria (UFSM), Brazil. (Pabula Henrique, “Why Send Humans to Mars? Looking Beyond Science” <http://journalofcosmology.com/Mars151.html>

The engineering challenges necessary to accomplish the human exploration of Mars will stimulate the global industrial machine and the human mind to think innovatively and continue to operate on the edge of technological possibility. Numerous technological spin-offs will be generated during such a project, and it will require the reduction or elimination of boundaries to collaboration among the scientific community. Exploration will also foster the incredible ingenuity necessary to develop technologies required to accomplish something so vast in scope and complexity. The benefits from this endeavor are by nature unknown at this time, but evidence of the benefits from space ventures undertaken thus far point to drastic improvement to daily life and potential benefits to humanity as whole. One example could come from the development of water recycling technologies designed to sustain a closed-loop life support system of several people for months or even years at a time (necessary if a human mission to Mars is attempted). This technology could then be applied to drought sufferers across the world or remote settlements that exist far from the safety net of mainstream society. The permanence of humans in a hostile environment like on Mars will require careful use of local resources. This necessity might stimulate the development of novel methods and technologies in energy extraction and usage that could benefit terrestrial exploitation and thus improve the management of and prolong the existence of resources on Earth.

## plan

The United States Federal Government should substantially increase funding for plutonium-238 energy production in the United States.

## 1AC solvency

#### Contention three is solvency—

#### There’s some funding now which disproves your links but it’s not enough for a robust program—the aff is key.

Morring ‘12

Frank, Aviation Week Writer, “High Hurdles,” lexis

McNutt told the AIAA symposium the situation isn't getting better fast, even though Congress has allocated some funds for NASA to restart production. NASA has been forced to «go it alone,» without funding help from the Energy Department or other agencies, as it is behind the pace to get things started again by 5-7 years. Once production restarts, the U.S. space agency believes it can produce «a couple of kilos in a year,» but that isn't going to cover the demand laid out in the National Research Council's decadal survey of exploration priorities: Uranus, the methane lakes of Titan and the water geysers of Enceladus. The shortfall would be compounded if human exploration begins drawing on the supply for long-duration missions beyond solar-power range.

#### DOE is key—

No other sources

Hoover et al ‘9

WILLIAM W. HOOVER, U.S. Air Force (retired), Co-Chair RALPH L. McNUTT, JR., Johns Hopkins University, Applied Physics Laboratory, Co-Chair DOUGLAS M. ALLEN, Schafer Corporation SAMIM ANGHAIE, University of Florida, Gainesville RETA F. BEEBE, New Mexico State University WARREN W. BUCK, University of Washington, Seattle BEVERLY A. COOK, Jet Propulsion Laboratory SERGIO B. GUARRO, The Aerospace Corporation ROGER D. LAUNIUS, Smithsonian Institution FRANK B. McDONALD, University of Maryland, College Park ALAN R. NEWHOUSE, Independent Consultant, Hollywood, Maryland JOSEPH A. SHOLTIS, JR., Sholtis Engineering and Safety Consulting SPENCER R. TITLEY, University of Arizona, Tucson EMANUEL TWARD, Northrop Grumman Space Technology EARL WAHLQUIST, U.S. Department of Energy (retired) Staff ALAN C. ANGLEMAN, Study Director, Aeronautics and Space Engineering Board DWAYNE A. DAY, Program Officer, Space Studies Board SARAH M. CAPOTE, Program Associate, Aeronautics and Space Engineering Board (through November 2008) CELESTE A. NAYLOR, Senior Program Assistant, Space Studies Board (from November 2008 through January 2009) ANDREA M. REBHOLZ, Program Associate, Aeronautics and Space Engineering Board (from February 2009), “Radioisotope Power Systems: An Imperative for Maintaining U.S. Leadership in Space Exploration,” http://www.lpi.usra.edu/leag/documents/12653.pdf

Plutonium-238 does not occur in nature. Unlike 239Pu, it is unsuitable for use in nuclear weapons. Plutonium-238 has been produced in quantity only for the purpose of fueling RPSs. In the past, the United States had an adequate supply of 238Pu, which was produced in facilities that existed to support the U.S. nuclear weapons program. The problem is that no 238Pu has been produced in the United States since the Department of Energy (DOE) shut down those facilities in the late 1980s. Since then, the U.S. space program has had to rely on the inventory of 238Pu that existed at that time, supplemented by the purchase of 238Pu from Russia. However, Russian facilities to produce 238Pu were also shut down many years ago, and the DOE will soon take delivery of its last shipment of 238Pu from Russia. The committee does not believe that there is any additional 238Pu (or any operational 238Pu production facilities) available anywhere in the world. The total amount of 238Pu available for NASA is fixed, and essentially all of it is already dedicated to support several pending missions⎯the Mars Science Laboratory, Discovery 12, the Outer Planets Flagship 1 (OPF 1), and (perhaps) a small number of additional missions with a very small demand for 238Pu. If the status quo persists, the United States will not be able to provide RPSs for any subsequent missions. Reestablishing domestic production of 238Pu will be expensive (the cost will likely exceed $150 million). Previous proposals to make this investment have not been enacted, and cost seems to be the major impediment. However, regardless of why these proposals have been rejected, the day of reckoning has arrived. NASA is already making mission-limiting decisions based on the short supply of 238Pu NASA is stretching out the pace of RPS-powered missions by eliminating RPSs as an option for some missions and delaying other missions that require RPSs until more 238Pu becomes available. Procuring 238Pu from Russia or other foreign nations is not a viable option because of schedule and national security considerations. Fortunately, there are two viable approaches for reestablishing production of 238Pu in the United States. Both of these approaches would use existing reactors at DOE facilities at Idaho National Laboratory and Oak Ridge National Laboratory with minimal modification, but a large capital investment in processing facilities would still be needed. Nonetheless, these are the best options in terms of cost, schedule, and risk for producing 238Pu in time to minimize the disruption in NASA’s space science and exploration missions powered by RPSs.

# 2AC

## Leadership

#### Pursuit of hegemony’s locked-in

Zach Dorfman 12, assistant editor of Ethics and International Affairs, the journal of the Carnegie Council, and co-editor of the Montreal Review, “What We Talk About When We Talk About Isolationism”, May 18, <http://dissentmagazine.org/online.php?id=605>

The rise of China notwithstanding, the United States remains the world’s sole superpower. Its military (and, to a considerable extent, political) hegemony extends not just over North America or even the Western hemisphere, but also Europe, large swaths of Asia, and Africa. Its interests are global; nothing is outside its potential sphere of influence. There are an estimated 660 to 900 American military bases in roughly forty countries worldwide, although figures on the matter are notoriously difficult to ascertain, largely because of subterfuge on the part of the military. According to official data there are active-duty U.S. military personnel in 148 countries, or over 75 percent of the world’s states. The United States checks Russian power in Europe and Chinese power in South Korea and Japan and Iranian power in Iraq, Afghanistan, and Turkey. In order to maintain a frigid peace between Israel and Egypt, the American government hands the former $2.7 billion in military aid every year, and the latter $1.3 billion. It also gives Pakistan more than $400 million dollars in military aid annually (not including counterinsurgency operations, which would drive the total far higher), Jordan roughly $200 million, and Colombia over $55 million. U.S. long-term military commitments are also manifold. It is one of the five permanent members of the UN Security Council, the only institution legally permitted to sanction the use of force to combat “threats to international peace and security.” In 1949 the United States helped found NATO, the first peacetime military alliance extending beyond North and South America in U.S. history, which now has twenty-eight member states. The United States also has a trilateral defense treaty with Australia and New Zealand, and bilateral mutual defense treaties with Japan, Taiwan, the Philippines, and South Korea. It is this sort of reach that led Madeleine Albright to call the United States the sole “indispensible power” on the world stage. The idea that global military dominance and political hegemony is in the U.S. national interest—and the world’s interest—is generally taken for granted domestically. Opposition to it is limited to the libertarian Right and anti-imperialist Left, both groups on the margins of mainstream political discourse. Today, American supremacy is assumed rather than argued for: in an age of tremendous political division, it is a bipartisan first principle of foreign policy, a presupposition. In this area at least, one wishes for a little less agreement. In Promise and Peril: America at the Dawn of a Global Age, Christopher McKnight Nichols provides an erudite account of a period before such a consensus existed, when ideas about America’s role on the world stage were fundamentally contested. As this year’s presidential election approaches, each side will portray the difference between the candidates’ positions on foreign policy as immense. Revisiting Promise and Peril shows us just how narrow the American worldview has become, and how our public discourse has become narrower still. Nichols focuses on the years between 1890 and 1940, during America’s initial ascent as a global power. He gives special attention to the formative debates surrounding the Spanish-American War, U.S. entry into the First World War, and potential U.S. membership in the League of Nations—debates that were constitutive of larger battles over the nature of American society and its fragile political institutions and freedoms. During this period, foreign and domestic policy were often linked as part of a cohesive political vision for the country. Nichols illustrates this through intellectual profiles of some of the period’s most influential figures, including senators Henry Cabot Lodge and William Borah, socialist leader Eugene Debs, philosopher and psychologist William James, journalist Randolph Bourne, and the peace activist Emily Balch. Each of them interpreted isolationism and internationalism in distinct ways, sometimes deploying the concepts more for rhetorical purposes than as cornerstones of a particular worldview. Today, isolationism is often portrayed as intellectually bankrupt, a redoubt for idealists, nationalists, xenophobes, and fools. Yet the term now used as a political epithet has deep roots in American political culture. Isolationist principles can be traced back to George Washington’s farewell address, during which he urged his countrymen to steer clear of “foreign entanglements” while actively seeking nonbinding commercial ties. (Whether economic commitments do in fact entail political commitments is another matter.) Thomas Jefferson echoed this sentiment when he urged for “commerce with all nations, [and] alliance with none.” Even the Monroe Doctrine, in which the United States declared itself the regional hegemon and demanded noninterference from European states in the Western hemisphere, was often viewed as a means of isolating the United States from Europe and its messy alliance system. In Nichols’s telling, however, modern isolationism was born from the debates surrounding the Spanish-American War and the U.S. annexation of the Philippines. Here isolationism began to take on a much more explicitly anti-imperialist bent. Progressive isolationists such as William James found U.S. policy in the Philippines—which it had “liberated” from Spanish rule just to fight a bloody counterinsurgency against Philippine nationalists—anathema to American democratic traditions and ideas about national self-determination. As Promise and Peril shows, however, “cosmopolitan isolationists” like James never called for “cultural, economic, or complete political separation from the rest of the world.” Rather, they wanted the United States to engage with other nations peacefully and without pretensions of domination. They saw the United States as a potential force for good in the world, but they also placed great value on neutrality and non-entanglement, and wanted America to focus on creating a more just domestic order. James’s anti-imperialism was directly related to his fear of the effects of “bigness.” He argued forcefully against all concentrations of power, especially those between business, political, and military interests. He knew that such vested interests would grow larger and more difficult to control if America became an overseas empire. Others, such as “isolationist imperialist” Henry Cabot Lodge, the powerful senator from Massachusetts, argued that fighting the Spanish-American War and annexing the Philippines were isolationist actions to their core. First, banishing the Spanish from the Caribbean comported with the Monroe Doctrine; second, adding colonies such as the Philippines would lead to greater economic growth without exposing the United States to the vicissitudes of outside trade. Prior to the Spanish-American War, many feared that the American economy’s rapid growth would lead to a surplus of domestic goods and cause an economic disaster. New markets needed to be opened, and the best way to do so was to dominate a given market—that is, a country—politically. Lodge’s defense of this “large policy” was public and, by today’s standards, quite bald. Other proponents of this policy included Teddy Roosevelt (who also believed that war was good for the national character) and a significant portion of the business class. For Lodge and Roosevelt, “isolationism” meant what is commonly referred to today as “unilateralism”: the ability for the United States to do what it wants, when it wants. Other “isolationists” espoused principles that we would today call internationalist. Randolph Bourne, a precocious journalist working for the New Republic, passionately opposed American entry into the First World War, much to the detriment of his writing career. He argued that hypernationalism would cause lasting damage to the American social fabric. He was especially repulsed by wartime campaigns to Americanize immigrants. Bourne instead envisioned a “transnational America”: a place that, because of its distinct cultural and political traditions and ethnic diversity, could become an example to the rest of the world. Its respect for plurality at home could influence other countries by example, but also by allowing it to mediate international disputes without becoming a party to them. Bourne wanted an America fully engaged with the world, but not embroiled in military conflicts or alliances. This was also the case for William Borah, the progressive Republican senator from Idaho. Borah was an agrarian populist and something of a Jeffersonian: he believed axiomatically in local democracy and rejected many forms of federal encroachment. He was opposed to extensive immigration, but not “anti-immigrant.” Borah thought that America was strengthened by its complex ethnic makeup and that an imbalance tilted toward one group or another would have deleterious effects. But it is his famously isolationist foreign policy views for which Borah is best known. As Nichols writes: He was consistent in an anti-imperialist stance against U.S. domination abroad; yet he was ambivalent in cases involving what he saw as involving obvious national interest….He also without fail argued that any open-ended military alliances were to be avoided at all costs, while arguing that to minimize war abroad as well as conflict at home should always be a top priority for American politicians. Borah thus cautiously supported entry into the First World War on national interest grounds, but also led a group of senators known as “the irreconcilables” in their successful effort to prevent U.S. entry into the League of Nations. His paramount concern was the collective security agreement in the organization’s charter: he would not assent to a treaty that stipulated that the United States would be obligated to intervene in wars between distant powers where the country had no serious interest at stake. Borah possessed an alternative vision for a more just and pacific international order. Less than a decade after he helped scuttle American accession to the League, he helped pass the Kellogg-Briand Pact (1928) in a nearly unanimous Senate vote. More than sixty states eventually became party to the pact, which outlawed war between its signatories and required them to settle their disputes through peaceful means. Today, realists sneer at the idealism of Kellogg-Briand, but the Senate was aware of the pact’s limitations and carved out clear exceptions for cases of national defense. Some supporters believed that, if nothing else, the law would help strengthen an emerging international norm against war. (Given what followed, this seems like a sad exercise in wish-fulfillment.) Unlike the League of Nations charter, the treaty faced almost no opposition from the isolationist bloc in the Senate, since it did not require the United States to enter into a collective security agreement or abrogate its sovereignty. This was a kind of internationalism Borah and his irreconcilables could proudly support. The United States today looks very different from the country in which Borah, let alone William James, lived, both domestically (where political and civil freedoms have been extended to women, African Americans, and gays and lesbians) and internationally (with its leading role in many global institutions). But different strains of isolationism persist. Newt Gingrich has argued for a policy of total “energy independence” (in other words, domestic drilling) while fulminating against President Obama for “bowing” to the Saudi king. While recently driving through an agricultural region of rural Colorado, I saw a giant roadside billboard calling for American withdrawal from the UN. Yet in the last decade, the Republican Party, with the partial exception of its Ron Paul/libertarian faction, has veered into such a belligerent unilateralism that its graybeards—one of whom, Senator Richard Lugar of Indiana, just lost a primary to a far-right challenger partly because of his reasonableness on foreign affairs—were barely able to ensure Senate ratification of a key nuclear arms reduction treaty with Russia. Many of these same people desire a unilateral war with Iran. And it isn’t just Republicans. Drone attacks have intensified in Yemen, Pakistan, and elsewhere under the Obama administration. Massive troop deployments continue unabated. We spend over $600 billion dollars a year on our military budget; the next largest is China’s, at “only” around $100 billion. Administrations come and go, but the national security state appears here to stay.

#### Unipolarity solves status-based great power war

Wohlforth ‘9

William, Daniel Webster Professor of Government at Dartmouth, Daniel Webster Professor of Government B.A., International Relations, Beloit College M.A., International Relations, Yale University M.Phil., Ph.D., Political Science, Yale University, “UNIPOLARITY, STATUS COMPETITION, AND GREAT POWER WAR,” [http://www.polisci.wisc.edu/Uploads/Documents/IRC/Wohlforth%20(2009).pdf](http://www.polisci.wisc.edu/Uploads/Documents/IRC/Wohlforth%20%282009%29.pdf), AM

The upshot is a near scholarly consensus that unpolarity’s consequences for great power conflict are indeterminate and that a power shift resulting in a return to bipolarity or multipolarity will not raise the specter of great power war. This article questions the consensus on two counts. First, I show that it depends crucially on a dubious assumption about human motivation. Prominent theories of war are based on the assumption that people are mainly motivated by the instrumental pursuit of tangible ends such as physical security and material prosperity. This is why such theories seem irrelevant to interactions among great powers in an international environment that diminishes the utility of war for the pursuit of such ends. Yet we know that people are motivated by a great many noninstrumental motives, not least by concerns regarding their social status. 3 As John Harsanyi noted, “Apart from economic payoffs, social status (social rank) seems to be the most important incentive and motivating force of social behavior.”4 This proposition rests on much firmer scientific ground now than when Harsanyi expressed it a generation ago, as cumulating research shows that humans appear to be hardwired for sensitivity to status and that relative standing is a powerful and independent motivator of behavior.5 Second, I question the dominant view that status quo evaluations are relatively independent of the distribution of capabilities. If the status of states depends in some measure on their relative capabilities, and if states derive utility from status, then different distributions of capabilities may affect levels of satisfaction, just as different income distributions may affect levels of status competition in domestic settings. 6 Building on research in psychology and sociology, I argue that even capabilities distributions among major powers foster ambiguous status hierarchies, which generate more dissatisfaction and clashes over the status quo. And the more stratified the distribution of capabilities, the less likely such status competition is. Unipolarity thus generates far fewer incentives than either bipolarity or multipolarity for direct great power positional competition over status. Elites in the other major powers continue to prefer higher status, but in a unipolar system they face comparatively weak incentives to translate that preference into costly action. And the absence of such incentives matters because social status is a positional good—something whose value depends on how much one has in relation to others.7 “If everyone has high status,” Randall Schweller notes, “no one does.”8 While one actor might increase its status, all cannot simultaneously do so. High status is thus inherently scarce, and competitions for status tend to be zero sum.9 I begin by describing the puzzles facing predominant theories that status competition might solve. Building on recent research on social identity and status seeking, I then show that under certain conditions the ways decision makers identify with the states they represent may prompt them to frame issues as positional disputes over status in a social hierarchy. I develop hypotheses that tailor this scholarship to the domain of great power politics, showing how the probability of status competition is likely to be linked to polarity. The rest of the article investigates whether there is sufficient evidence for these hypotheses to warrant further refinement and testing. I pursue this in three ways: by showing that the theory advanced here is consistent with what we know about large-scale patterns of great power conflict through history; by demonstrating that the causal mechanisms it identifies did drive relatively secure major powers to military conflict in the past (and therefore that they might do so again if the world were bipolar or multipolar); and by showing that observable evidence concerning the major powers’ identity politics and grand strategies under unipolarity are consistent with the theory’s expectations.

#### Plan solves asteroid deflection—prevents extinction

Benson ’12

(Michael, author of “Beyond: Visions of the Interplanetary Probes” and “Far Out: A Space-Time Chronicle”, “Exploring the Planets Enriches Us At Home”, International Herald Tribune, reprinted in the New York Times, 8-11-2012, http://www.nytimes.com/2012/08/11/opinion/exploring-the-planets-enriches-us-at-home.html)

Many other wholly pragmatic reasons exist to pursue a vigorous program of interplanetary space exploration. These range from the utility of understanding the climatological stories of our neighboring terrestrial planets Venus and Mars (one of which swelters under a runaway greenhouse effect enforced by its dense atmosphere, with the other being a frigid desert world), to the usefulness of investigating the geology of near-Earth asteroids, and thus how they could potentially best be deflected from Earth-intersecting, and potentially civilization-ending, trajectories.

#### The aff solves the impact to biosphere destruction.

Squyres et al ’12

(Chair of the Planetary Science Decadal Survey, Steering Group STEVEN W. SQUYRES, Cornell University, Chair LAURENCE A. SODERBLOM, U.S. Geological Survey, Vice Chair WENDY M. CALVIN, University of Nevada, Reno DALE CRUIKSHANK, NASA Ames Research Center PASCALE EHRENFREUND, George Washington University G. SCOTT HUBBARD, Stanford University WESLEY T. HUNTRESS, JR., Carnegie Institution of Washington (retired) (until November 2009) MARGARET G. KIVELSON, University of California, Los Angeles B. GENTRY LEE, NASA Jet Propulsion Laboratory JANE LUU, Massachusetts Institute of Technology, Lincoln Laboratory STEPHEN MACKWELL, Lunar and Planetary Institute RALPH L. McNUTT, JR., Johns Hopkins University, Applied Physics Laboratory HARRY Y. McSWEEN, JR., University of Tennessee, Knoxville GEORGE A. PAULIKAS, The Aerospace Corporation (retired) (from January 2010) AMY SIMON-MILLER, NASA Goddard Space Flight Center DAVID J. STEVENSON, California Institute of Technology A. THOMAS YOUNG, Lockheed Martin Corporation (retired) Inner Planets Panel ELLEN R. STOFAN, Proxemy Research, Inc., Chair STEPHEN MACKWELL, Lunar and Planetary Institute, Vice Chair BARBARA A. COHEN, NASA Marshall Space Flight Center MARTHA S. GILMORE, Wesleyan University LORI GLAZE, NASA Goddard Space Flight Center DAVID H. GRINSPOON, Denver Museum of Nature and Science STEVEN A. HAUCK II, Case Western Reserve University AYANNA M. HOWARD, Georgia Institute of Technology CHARLES K. SHEARER, University of New Mexico DOUGLAS S. STETSON, Space Science and Exploration Consulting Group EDWARD M. STOLPER, California Institute of Technology ALLAN H. TREIMAN, Lunar and Planetary Institute Mars Panel PHILIP R. CHRISTENSEN, Arizona State University, Chair WENDY M. CALVIN, University of Nevada, Reno, Vice Chair RAYMOND E. ARVIDSON, Washington University ROBERT D. BRAUN, Georgia Institute of Technology (until February 2010) GLENN E. CUNNINGHAM, Jet Propulsion Laboratory (retired) DAVID DES MARAIS, NASA Ames Research Center (until August 2010) LINDA T. ELKINS-TANTON, Massachusetts Institute of Technology FRANCOIS FORGET, Université de Paris 6 JOHN P. GROTZINGER, California Institute of Technology PENELOPE KING, University of New Mexico PHILIPPE LOGNONNE, Institut de Physique du Globe de Paris PAUL R. MAHAFFY, NASA Goddard Space Flight Center LISA M. PRATT, Indiana University Giant Planets Panel HEIDI B. HAMMEL, Association of Universities for Research in Astronomy, Inc., Chair AMY SIMON-MILLER, NASA Goddard Space Flight Center, Vice Chair RETA F. BEEBE, New Mexico State University JOHN R. CASANI, Jet Propulsion Laboratory JOHN CLARKE, Boston University BRIGETTE HESMAN, University of Maryland WILLIAM B. HUBBARD, University of Arizona MARK S. MARLEY, NASA Ames Research Center PHILIP D. NICHOLSON, Cornell University R. WAYNE RICHIE, NASA Langley Research Center (retired) KUNIO M. SAYANAGI, California Institute of Technology Satellites Panel JOHN SPENCER, Southwest Research Institute, Boulder, Chair DAVID J. STEVENSON, California Institute of Technology, Vice Chair GLENN FOUNTAIN, Johns Hopkins University, Applied Physics Laboratory CAITLIN ANN GRIFFITH, University of Arizona KRISHAN KHURANA, University of California, Los Angeles CHRISTOPHER P. McKAY, NASA Ames Research Center FRANCIS NIMMO, University of California, Santa Cruz LOUISE M. PROCKTER, Johns Hopkins University, Applied Physics Laboratory GERALD SCHUBERT, University of California, Los Angeles THOMAS R. SPILKER, NASA Jet Propulsion Laboratory ELIZABETH P. TURTLE, Johns Hopkins University, Applied Physics Laboratory J. HUNTER WAITE, JR., Southwest Research Institute, San Antonio Primitive Bodies Panel JOSEPH F. VEVERKA, Cornell University, Chair HARRY Y. McSWEEN, JR., University of Tennessee, Knoxville, Vice Chair ERIK ASPHAUG, University of California, Santa Cruz MICHAEL E. BROWN, California Institute of Technology DONALD E. BROWNLEE, University of Washington MARC BUIE, Southwest Research Institute, Boulder TIMOTHY J. McCOY, Smithsonian Institution, National Museum of Natural History MARC D. RAYMAN, NASA Jet Propulsion Laboratory EDWARD REYNOLDS, Johns Hopkins University, Applied Physics Laboratory MARK SEPHTON, Imperial College London JESSICA SUNSHINE, University of Maryland FAITH VILAS, Planetary Science InstituteCopyright © National Academy of Sciences. All rights reserved. Vision and Voyages for Planetary Science in the Decade 2013-2022 vii Staff DAVID H. SMITH, Senior Program Officer, Study Director DWAYNE DAY, Senior Program Officer ABIGAIL SHEFFER, Associate Program Officer CATHERINE A. GRUBER, Editor DIONNA WILLIAMS, Program Associate LEWIS GROSWALD, Research Associate RODNEY HOWARD, Senior Program Assistant ELENA AMADOR, Lloyd V. Berkner Space Policy Intern (2009) GABRIELE BETANCOURT-MARTINEZ, Lloyd V. Berkner Space Policy Intern (2010) JORDAN BOCK, Lloyd V. Berkner Space Policy Intern (2009) DARA FISHER, Lloyd V. Berkner Space Policy Intern (2010) ABIGAIL FRAEMAN, Space Policy Intern (2009) ANDREAS FRICK, Lloyd V. Berkner Space Policy Intern (2010) ANGIE WOLFGANG, Lloyd V. Berkner Space Policy Intern (2009) MICHAEL H. MOLONEY, Director, Space Studies Board, Vision and Voyages for Planetary Science in the Decade 2013-2022, The National Academies Press, 2012, <http://science.nasa.gov/media/medialibrary/2012/08/29/Planetary_DS.pdf>

In the past, scientists had only one planet to study in detail. Our Earth, however, the only place where life demonstrably exists and thrives, is a complex interwoven system of atmosphere, hydrosphere, lithosphere, and biosphere. Today, planetary scientists can apply their knowledge to the whole solar system, and to hundreds of worlds around other stars. By investigating planetary properties and processes in different settings, some of them far simpler than Earth, we gain substantial advances in understanding exactly how planets form, how the complex interplay of diverse physical and chemical processes creates the diversity of planetary environments seen in the solar system today, and how interactions between the physical and chemical processes on at least one of those planets led to the creation of conditions favoring the origin and evolution of multifarious forms of life. These basic motivational threads are built on and developed into the three principal science themes of this report—building new worlds, workings of solar systems, and planetary habitats—discussed in Chapter 3. Current understanding of Earth’s surface and climate are constrained by studies of the physical processes operating on other worlds. The destructive role of chlorofluorocarbons in Earth’s atmosphere was recognized by a scientist studying the chemistry of Venus’s atmosphere. Knowledge of the “greenhouse” effect, a mechanism in the ongoing global warming on Earth, likewise came from studies of Venus. Comparative studies of the atmospheres of Mars, Venus, and Earth yield critical insights into the evolutionary histories of terrestrial planet atmospheres. Similarly, studies of the crater-pocked surface of the Moon led to current understanding of the key role played by impacts in shaping planetary environments. The insights derived from studies of lunar craters led to the realization that destructive impacts have wreaked havoc on Earth in the distant past, and as recently as 100 years ago a devastating blast in Siberia leveled trees over an area the size of metropolitan Washington, D.C. Three recent impacts on Jupiter provide our best laboratory for studying the mechanics of such biosphere-disrupting events. Wind-driven processes that shape Earth’s desert dunes operate on Mars and even on Saturn’s moon Titan.

#### American hegemonic decline causes preemptive lash-out, collapses global trade and makes global problems such as warming, water scarcity and disease inevitable.

Beckley ‘12

Michael, Assistant professor of political science at Tufts, research fellow in the International Security Program at Harvard Kennedy School's. Belfer Center for Science and International Affairs, “The Unipolar Era: Why American Power Persists and China’s Rise Is Limited,” PhD dissertation, AM

One danger is that declinism could prompt trade conflicts and immigration restrictions. The results of this study suggest that the United States benefits immensely from the free flow of goods, services, and people around the globe; this is what allows American corporations to specialize in high-­‐value activities, exploit innovations created elsewhere, and lure the brightest minds to the United States, all while reducing the price of goods for U.S. consumers. Characterizing China’s export expansion as a loss for the United States is not just bad economics; it blazes a trail for jingoistic and protectionist policies. It would be tragically ironic if Americans reacted to false prophecies of decline by cutting themselves off from a potentially vital source of American power. Another danger is that declinism may impair foreign policy decision-­‐making. If top government officials come to believe that China is overtaking the United States, they are likely to react in one of two ways, both of which are potentially disastrous. The first is that policymakers may imagine the United States faces a closing “window of opportunity” and should take action “while it still enjoys preponderance and not wait until the diffusion of power has already made international politics more competitive and unpredictable.”315 This belief may spur positive action, but it also invites parochial thinking, reckless behavior, and preventive war.316 As Robert Gilpin and others have shown, “hegemonic struggles have most frequently been triggered by fears of ultimate decline and the perceived erosion of power.”317 By fanning such fears, declinists may inadvertently promote the type of violent overreaction that they seek to prevent. The other potential reaction is retrenchment – the divestment of all foreign policy obligations save those linked to vital interests, defined in a narrow and national manner. Advocates of retrenchment assume, or hope, that the world will sort itself out on its own; that whatever replaces American hegemony, whether it be a return to balance-­‐of-­‐power politics or a transition to a post-­‐power paradise, will naturally maintain international order and prosperity. But order and prosperity are unnatural. They can never be presumed. When achieved, they are the result of determined action by powerful actors and, in particular, by the most powerful actor, which is, and will be for some time, the United States. Arms buildups, insecure sea-­‐lanes, and closed markets are only the most obvious risks of U.S. retrenchment. Less obvious are transnational problems, such as global warming, water scarcity, and disease, which may fester without a leader to rally collective action.

## Missions

#### Not nearly funded enough

Ferro 3/14/13

Shaunacy, Popular Science, “NASA Resumes Production Of Plutonium-238 Space Fuel After 25 Years,” <http://www.popsci.com/science/article/2013-03/first-time-cold-war-us-making-plutonium-238>

Since 2009, we've been wringing our hands over how to get enough of the fuel to power our future space exploration. Congress threw NASA $10 million of its requested $30 million budget to start production, but denied the Department of Energy's funding requests three years in a row.

#### Only 1.5 kilos a year.

Ferro 3/14/13

Shaunacy, Popular Science, “NASA Resumes Production Of Plutonium-238 Space Fuel After 25 Years,” <http://www.popsci.com/science/article/2013-03/first-time-cold-war-us-making-plutonium-238>

That process seems to be off to a good start, luckily. Jim Green, director of NASA's Planetary Science Division, announced at a Mars exploration planning meeting that the DOE has successfully generated plutonium at Oak Ridge National Laboratory in Tennessee, according to Discovery News. Green said he expects a little more than three pounds of plutonium to be generated per year. New supplies of plutonium could be mixed with the small existing supply of U.S. plutonium to bring the depleted plutonium up to the necessary energy density.

#### That’s insufficient—expert consensus

Hoover et al ‘9

WILLIAM W. HOOVER, U.S. Air Force (retired), Co-Chair RALPH L. McNUTT, JR., Johns Hopkins University, Applied Physics Laboratory, Co-Chair DOUGLAS M. ALLEN, Schafer Corporation SAMIM ANGHAIE, University of Florida, Gainesville RETA F. BEEBE, New Mexico State University WARREN W. BUCK, University of Washington, Seattle BEVERLY A. COOK, Jet Propulsion Laboratory SERGIO B. GUARRO, The Aerospace Corporation ROGER D. LAUNIUS, Smithsonian Institution FRANK B. McDONALD, University of Maryland, College Park ALAN R. NEWHOUSE, Independent Consultant, Hollywood, Maryland JOSEPH A. SHOLTIS, JR., Sholtis Engineering and Safety Consulting SPENCER R. TITLEY, University of Arizona, Tucson EMANUEL TWARD, Northrop Grumman Space Technology EARL WAHLQUIST, U.S. Department of Energy (retired) Staff ALAN C. ANGLEMAN, Study Director, Aeronautics and Space Engineering Board DWAYNE A. DAY, Program Officer, Space Studies Board SARAH M. CAPOTE, Program Associate, Aeronautics and Space Engineering Board (through November 2008) CELESTE A. NAYLOR, Senior Program Assistant, Space Studies Board (from November 2008 through January 2009) ANDREA M. REBHOLZ, Program Associate, Aeronautics and Space Engineering Board (from February 2009), “Radioisotope Power Systems: An Imperative for Maintaining U.S. Leadership in Space Exploration,” http://www.lpi.usra.edu/leag/documents/12653.pdf

The fiscal year 2010 federal budget should fund the Department of Energy (DOE) to reestablish production of 238Pu. • As soon as possible, the DOE and the Office of Management and Budget should request— and Congress should provide—adequate funds to produce 5 kg of 238Pu per year.

#### Not enough for staffed missions which means we can’t go to Mars.

Wall ‘12

Michael, space.com senior writer, “Plutonium Production May Avert Spacecraft Fuel Shortage,” http://www.space.com/15184-plutonium238-spacecraft-fuel-production.html

Despite the bad budget news, some restart planning and technological development are already underway, according to Carroll. And NASA is doing what it can to help the project along. "Right now, I think there's $10 million in this year's budget and $10 million in next year's budget, which we do plan on sending to the Department of Energy to continue the efforts that we've begun," Leonard Dudzinski, a NASA program executive who deals with radioisotope power systems, said at the NETS conference. "I'm fully confident that we will be able to continue this, and ultimately have plutonium produced in this country again in kilogram quantities, on an annual basis," he added. The goal is to eventually produce between 3.3 pounds and 4.4 pounds (1.5 to 2 kg) of plutonium-238 per year, which should be enough to support NASA's robotic planetary science missions, Dudzinsky said. "Now, if there were other missions that came along on the human side, then I think we would need more," he added. "But to date, those missions have not materialized."

#### Only NASA can do it

Seedhouse ‘9

(Erik, aerospace scientist and manned spaceflight consultant, Martian Outpost, p.10)

The cautious approach of NASA has been evident over the last three decades as astronauts have been confined to LEO operations using the less-than-ideal Space Shuttle to visit the problem-ridden International Space Station (ISS). Today, NASA's deeply-ingrained safety culture is even more entrenched in the wake of the 2003 Space Shuttle Columbia tragedy, a reason the agency wants to wait until 2031 before attempting to land humans on Mars. NASA's biggest argument against sending people to Mars now is that not enough is known about how to prevent bone demineralization, protect astronauts from radiation exposure during such long missions or how to ensure their safety during the dangerous entry, descent and landing (EDL) phase. Of course it is hard to stand up against safety in a world where cars are equipped with multiple airbags and antilock brakes and where people hold McDonalds responsible for scalding them with coffee that is too hot! Unfortunately, such a safety culture is the exact opposite to many people's ideas of what explorers should do. Historically explorers risk their lives and sometimes they die. When the Space Shuttle Columbia disintegrated on re-entry on February 1, 2003, there were some people who argued the manned space program was just too risky and should be shut down. The reality is that risk-free exploration does not and cannot exist. Barring a Presidential edict however, it is difficult to see how NASA would accelerate its Mars program. That said, NASA is probably the one space agency that can succeed in attaining the goal of landing humans on Mars. One reason is that NASA is a national institution that enjoys an extraordinarily positive approval rating. The American public love NASA, pure and simple, and even if the average American may not be sure exactly what NASA does, such strong brand loyalty is an asset for the agency's future because such support has an important bearing upon funding and space policy-making. While there may never be another "Man. Moon, decade" speech, NASA will succeed because they have succeeded in so many other space endeavors. For all its political flaws, the construction of the ISS was mainly a NASA project and its near-completion represents the greatest engineering project in the history of [hu]mankind. Furthermore, the construction of the ISS was a multi-decade achievement akin to what will be required for a [staffed] manned mission to Mars.

## K

#### Role of the ballot’s to simulate enactment of the plan – key to decisionmaking and fairness

Hager, professor of political science – Bryn Mawr College, ‘92

(Carol J., “Democratizing Technology: Citizen & State in West German Energy Politics, 1974-1990” *Polity*, Vol. 25, No. 1, p. 45-70)

During this phase, the citizen initiative attempted to overcome its defensive posture and **implement an alternative politics.** The strategy of legal and technical challenge might delay or even prevent plant construction, but it would not by itself accomplish the broader goal on the legitimation dimension, i.e., democratization. Indeed, it worked against broad participation. The activists had to find a viable means of achieving change. Citizens had proved they could contribute to a **substantive policy discussion.** Now, some activists turned to the parliamentary arena as a possible forum for an energy dialogue. Until now, parliament had been conspicuously absent as a relevant policy maker, but if parliament could be reshaped and activated, citizens would have a forum in which to address the broad questions of policy-making goals and forms. They would also have an **institutional lever** with which to pry apart the bureaucracy and utility. None of the established political parties could offer an alternative program. Thus, local activists met to discuss forming their own voting list. These discussions provoked internal dissent. Many citizen initiative members objected to the idea of forming a political party. If the problem lay in the role of parliament itself, another political party would not solve it. On the contrary, parliamentary participation was likely to destroy what political innovations the extraparliamentary movement had made. Others argued that a political party would give the movement an institutional platform from which to introduce some of the grassroots democratic political forms the groups had developed. Founding a party as the parliamentary arm of the citizen movement would allow these groups to play an active, critical role in institutionalized politics, participating in the policy debates while retaining their outside perspective. Despite the disagreements, the Alternative List for Democracy and Environmental Protection Berlin (AL) was formed in 1978 and first won seats in the Land parliament with 7.2 percent of the vote in 1981.43 The founders of the AL were encouraged by the success of newly formed local green parties in Lower Saxony and Hamburg,44 whose evolution had been very similar to that of the West Berlin citizen move-ment. Throughout the FRG, unpopular administrative decisions affect-ing local environments, generally in the form of state-sponsored indus-trial projects, prompted the development of the citizen initiative and ecology movements. The groups in turn focused constant attention on state planning "errors," calling into question not only the decisions themselves, but also the conventional forms of political decision making that produced them.45 Disgruntled citizens increasingly aimed their critique at the established political parties, in particular the federal SPD/ FDP coalition, which seemed unable to cope with the economic, social, and political problems of the 1970s. Fanned by publications such as the Club of Rome's report, "The Limits to Growth," the view spread among activists that the crisis phenomena were not merely a passing phase, but indicated instead "a long-term structural crisis, whose cause lies in the industrial-technocratic growth society itself."46 As they broadened their critique to include the political **system as a whole**, many grassroots groups found the extraparliamentary arena too restrictive. Like many in the West Berlin group, they reasoned that the necessary change would require a degree of political restructuring that could only be accomplished through their direct participation in parliamentary politics. Green/alternative parties and voting lists sprang up nationwide and began to win seats in local assemblies. The West Berlin Alternative List saw itself not as a party, but as the parliamentary arm of the citizen initiative movement. One member explains: "the starting point for alternative electoral participation was simply the notion of achieving a greater audience for [our] own ideas and thus to work in support of the extraparliamentary movements and initia-tives,"47 including non-environmentally oriented groups. The AL wanted to avoid developing structures and functions autonomous from the citizen initiative movement. Members adhered to a list of principles, such as rotation and the imperative mandate, designed to keep parliamentarians attached to the grassroots. Although their insistence on grassroots democracy often resulted in interminable heated discussions, the participants recognized the importance of experimenting with new forms of decision making, of not succumbing to the same hierarchical forms they were challenging. Some argued that the proper role of citizen initiative groups was not to represent the public in government, but to mobilize other citizens to **participate directly in politics themselves**; self-determination was the aim of their activity.48 Once in parliament, the AL proposed establishmento f a temporary parliamentaryco mmissiont o studye nergyp olicy,w hichf or the first time would draw all concernedp articipantst ogetheri n a discussiono f both short-termc hoicesa nd long-termg oals of energyp olicy. With help from the SPD faction, which had been forced into the opposition by its defeat in the 1981 elections, two such commissions were created, one in 1982-83 and the other in 1984-85.49T hese commissionsg ave the citizen activists the forum they sought to push for modernizationa nd technicali nnovation in energy policy. Although it had scaled down the proposed new plant, the utility had produced no plan to upgrade its older, more polluting facilities or to install desulfurizationd evices. With proddingf rom the energyc ommission, Land and utility experts began to formulate such a plan, as did the citizen initiative. By exposing administrative failings in a public setting, and **by producing a** modernization **plan itself**, the combined citizen initiative and AL forced bureaucratic authorities to push the utility for improvements. They also forced the authorities to consider different technological solutions to West Berlin's energy and environmental problems. In this way, the activists served as technological innovators. In 1983, the first energy commission submitted a list of recommendations to the Land parliament which reflected the influence of the citizen protest movement. It emphasized goals of demand reduction and efficiency, noted the value of expanded citizen participation and urged authorities to "investigate more closely the positive role citizen participation can play in achieving policy goals."50 The second energy commission was created in 1984 to discuss the possibilities for modernization and shutdown of old plants and use of new, environmentally friendlier and cheaper technologies for electricity and heat generation. Its recommendations strengthened those of the first commission.51 Despite the non-binding nature of the commissions' recommendations, the public discussion of energy policy motivated policy makers to take stronger positions in favor of environmental protection. III. Conclusion The West Berlin energy project eventually cleared all planning hurdles, and construction began in the early 1980s. The new plant now conforms to the increasingly stringent environmental protection requirements of the law. The project was delayed, scaled down from 1200 to 600 MW, moved to a neutral location and, unlike other BEWAG plants, equipped with modern desulfurization devices. That the new plant, which opened in winter 1988-89, is the technologically most advanced and environmen-tally sound of BEWAG's plants is due entirely to the long legal battle with the citizen initiative group, during which nearly every aspect of the original plans was changed. In addition, through the efforts of the Alter-native List (AL) in parliament, the Land government and BEWAG formulated a long sought modernization and environmental protection plan for all of the city's plants. The AL prompted the other parliamentary parties to take pollution control seriously. Throughout the FRG, energy politics evolved in a similar fashion. As Habermas claimed, underlying the **objections against particular projects** was a reaction against the administrative-economic system in general. One author, for example, describes the emergence of two-dimensional protest against nuclear energy: The resistance against a concrete project became understood simul-taneously as resistance against the entire atomic program. Questions of energy planning, of economic growth, of understanding of democracy entered the picture. . . . Besides concern for human health, for security of conditions for human existence and protec-tion of nature arose critique of what was perceived as undemocratic planning, the "shock" of the delayed public announcement of pro-ject plans and the fear of political decision errors that would aggra-vate the problem.52 This passage supports a West Berliner's statement that the citizen initiative began with a project critique and arrived at *Systemkritik*.53 I have labeled these two aspects of the problem the public policy and legitima-tion dimensions. In the course of these conflicts, the legitimation dimen-sion emergd as the more important and in many ways the more prob-lematic. Parliamentary Politics In the 1970s, energy politics began to develop in the direction Offe de-scribed, with bureaucrats and protesters avoiding the parliamentary channels through which they should interact. The citizen groups them-selves, however, have to a degree reversed the slide into irrelevance of parliamentary politics. Grassroots groups overcame their defensive posture enough to begin to **formulate an alternative politics**, based upon concepts such as decision making through mutual understanding rather than technical criteria or bargaining. This new politics required new modes of interaction which the old corporatist or pluralist forms could not provide. Through the formation of green/alternative parties and voting lists and through new parliamentary commissions such as the two described in the case study, some members of grassroots groups attempted to both operate within the political system and fundamentally change it, to restore the link between bureaucracy and citizenry. Parliamentary politics was partially revived in the eyes of West German grassroots groups as a legitimate realm of citizen participation, an outcome the theory would not predict. It is not clear, however, that strengthening the parliamentary system would be a desirable outcome for everyone. Many remain skeptical that institutions that operate as part of the "system" can offer the kind of substantive participation that grass-roots groups want. The constant tension between institutionalized politics and grassroots action emerged clearly in the recent internal debate between "fundamentalist" and "realist" wings of the Greens. Fundis wanted to keep a firm footing outside the realm of institutionalized politics. They refused to bargain with the more established parties or to join coalition governments. Realos favored participating in institutionalized politics while pressing their grassroots agenda. Only this way, they claimed, would they have a chance to implement at least some parts of their program. This internal debate, which has never been resolved, can be interpreted in different ways. On one hand, the tension limits the appeal of green and alternative parties to the broader public, as the Greens' poor showing in the December 1990 all-German elections attests. The failure to come to agreement on basic issues can be viewed as a hazard of grass-roots democracy. The Greens, like the West Berlin citizen initiative, are opposed in principle to forcing one faction to give way to another. Disunity thus persists within the group. **On the other hand**, the tension can be understood not as a failure, but as a kind of success: grassroots politics has not been absorbed into the bureaucratized system; it retains its critical dimension, both in relation to the political system and within the groups themselves. The **lively debate** stimulated by grassroots groups and parties **keeps questions of democracy on the public agenda.** Technical Debate In West Berlin, the two-dimensionality of the energy issue forced citizen activists to become both participants in and critics of the policy process. In order to defeat the plant, **activists engaged in technical debate.** They won several decisions in favor of environmental protection, often **proving to be more informed than bureaucratic experts** themselves. The case study demonstrates that grassroots groups, far from impeding techno-logical advancement, can actually serve as technological innovators. The activists' role as technical experts, while it helped them achieve some success on the policy dimension, had mixed results on the legitimation dimension. On one hand, it helped them to challenge the legitimacy of technocratic policy making. They turned back the Land government's attempts to displace political problems by formulating them in technical terms.54 By demonstrating the fallibility of the technical arguments, activists forced authorities to acknowledge that energy demand was a political variable, whose value at any one point was as much influenced by the choices of policy makers as by independent technical criteria. Submission to the form and language of technical debate, however, weakened activists' attempts to introduce an alternative, goal-oriented form of decision making into the political system. Those wishing to par-ticipate in energy politics on a long-term basis have had to accede to the language of bureaucratic discussion, if not the legitimacy of bureaucratic authorities. They have helped break down bureaucratic authority but have not yet offered a viable long-term alternative to bureaucracy. In the tension between form and language, goals and procedure, the legitima-tion issue persists. At the very least, however, grassroots action challenges critical theory's notion that technical discussion is inimical to democratic politics.55 Citizen groups have raised the possibility of a dialogue that is both technically sophisticated and democratic. In sum, although the legitimation problems which gave rise to grass-roots protest have not been resolved, citizen action has worked to counter the marginalization of parliamentary politics and the technocratic character of policy debate that Offe and Habermas identify. The West Berlin case suggests that the solutions to current legitimation problems may not require total repudiation of those things previously associated with technocracy.56 In Berlin, the citizen initiative and AL continue to search for new, more legitimate forms of organization consistent with their principles. No permanent Land parliamentary body exists to coordinate and con-solidate energy policy making.57 In the 1989 Land elections, the CDU/ FDP coalition was defeated, and the AL formed a governing coalition with the SPD. In late 1990, however, the AL withdrew from the coali-tion. It remains to be seen whether the AL will remain an effective vehi-cle for grassroots concerns, and whether the citizenry itself, now includ-ing the former East Berliners, will remain active enough to give the AL direction as united Berlin faces the formidable challenges of the 1990s. On the policy dimension, grassroots groups achieved some success. On the legitimation dimension, it is difficult to judge the results of grass-roots activism by normal standards of efficacy or success. Activists have certainly not radically restructured politics. They agree that democracy is desirable, but troublesome questions persist about the degree to which those processes that are now bureaucratically organized can and should be restructured, where grassroots democracy is possible and where bureaucracy is necessary in order to get things done. In other words, grassroots groups have tried to remedy the Weberian problem of the marginalization of politics, but it is not yet clear what the boundaries of the political realm should be. It is, however, the act of calling existing boundaries into question that keeps democracy vital. In raising alternative possibilities and encouraging citizens to take an active, critical role in their own governance, the **contribution of grassroots** environmental **groups has been significant.** As Melucci states for new social movements in general, these groups mount a "symbolic" challenge by proposing "a different way of perceiving and naming the world."58 Rochon concurs for the case of the West German peace movement, noting that its effect on the public discussion of secur-ity issues **has been tremendous**.59 The effects of the legitimation issue in the FRG are evident in increased citizen interest in areas formerly left to technical experts. Citizens have formed nationwide associations of environmental and other grassroots groups as well as alternative and green parties at all levels of government. The level of information within the groups is generally quite high, and their participation, especially in local politics, has raised the awareness and engagement of the general populace noticeably.60 **Policy concessions** and new legal provisions for citizen participation **have not quelled grassroots action.** The attempts of the established political parties to coopt "green" issues have also met with limited success. Even green parties themselves have not tapped the full potential of public support for these issues. The persistence of legitima-tion concerns, along with the growth of a culture of informed political activism, will ensure that the search continues for a space for a delibera-tive politics in modern technological society.61

#### Util’s the only moral framework

**Murray 97** (Alastair, Professor of Politics at U. Of Wales-Swansea, *Reconstructing Realism*, p. 110)

Weber emphasised that, while the 'absolute ethic of the gospel' must be taken seriously, it is inadequate to the tasks of evaluation presented by politics. Against this 'ethic of ultimate ends' — Gesinnung — he therefore proposed the 'ethic of responsibility' — Verantwortung. First, whilst the former dictates only the purity of intentions and pays no attention to consequences, the ethic of responsibility commands acknowledgement of the divergence between intention and result. Its adherent 'does not feel in a position to burden others with the results of his [OR HER] own actions so far as he was able to foresee them; he [OR SHE] will say: these results are ascribed to my action'. Second, the 'ethic of ultimate ends' is incapable of dealing adequately with the moral dilemma presented by the necessity of using evil means to achieve moral ends: Everything that is striven for through political action operating with violent means and following an ethic of responsibility endangers the 'salvation of the soul.' If, however, one chases after the ultimate good in a war of beliefs, following a pure ethic of absolute ends, then the goals may be changed and discredited for generations, because responsibility for consequences is lacking. The 'ethic of responsibility', on the other hand, can accommodate this paradox and limit the employment of such means, because it accepts responsibility for the consequences which they imply. Thus, Weber maintains that only the ethic of responsibility can cope with the 'inner tension' between the 'demon of politics' and 'the god of love'. 9 The realists followed this conception closely in their formulation of a political ethic.10 This influence is particularly clear in Morgenthau.11 In terms of the first element of this conception, the rejection of a purely deontological ethic, Morgenthau echoed Weber's formulation, arguing tha/t:the political actor has, beyond the general moral duties, a special moral responsibility to act wisely ... The individual, acting on his own behalf, may act unwisely without moral reproach as long as the consequences of his inexpedient action concern only [HER OR] himself. What is done in the political sphere by its very nature concerns others who must suffer from unwise action. What is here done with good intentions but unwisely and hence with disastrous results is morally defective; for it violates the ethics of responsibility to which all action affecting others, and hence political action par excellence, is subject.12 This led Morgenthau to argue, in terms of the concern to reject doctrines which advocate that the end justifies the means, that the impossibility of the logic underlying this doctrine 'leads to the negation of absolute ethical judgements altogether'.13

#### Lift is always valuable

**Torchia 2**, Professor of Philosophy, Providence College, Phd in Philosophy, Fordham College (Joseph, “Postmodernism and the Persistent Vegetative State,” The National Catholic Bioethics Quarterly Summer 2002, Vol. 2, No. 2, <http://www.lifeissues.net/writers/torc/torc_01postmodernismandpvs1.html>)

Ultimately, Aquinas' theory of personhood requires a metaphysical explanation that is rooted in an understanding of the primacy of the existence or esse of the human person. For humans beings, the upshot of this position is clear: while human personhood is intimately connected with a broad range of actions (including consciousness of oneself and others), the definition of personhood is not based upon any specific activity or capacity for action, but upon the primacy of esse. Indeed, human actions would have neither a cause nor any referent in the absence of a stable, abiding self that is rooted in the person's very being. A commitment to the primacy of esse, then, allows for an adequate recognition of the importance of actions in human life, while providing a principle for the unification and stabilizing of these behavioral features. In this respect, the human person is defined as a dynamic being which actualizes the potentiality for certain behavior or operations unique to his or her own existence. Esse thereby embraces all that the person is and is capable of doing.

In the final analysis, **any attempt to define the person in terms of a single attribute, activity, or capability** (e.g., consciousness) flies in the face of the depth and multi-dimensionality which is part and parcel of personhood itself. To do so **would abdicate the ontological core of the person and the very center which renders human activities intelligible**. And Aquinas' anthropology, I submit, provides an effective philosophical lens through which the depth and profundity of the human reality comes into sharp focus. In this respect, Kenneth Schmitz draws an illuminating distinction between "person" (a term which conveys such hidden depth and profundity) and "personality" (a term which pertains to surface impressions and one's public image).40 The preoccupation with the latter term, he shows, is very much an outgrowth of the eighteenth century emphasis upon a human individuality that is understood in terms of autonomy and privacy. This notion of the isolated, atomistic individual was closely linked with a subjective focus whereby the "self" became the ultimate referent for judging reality. By extension, such a presupposition led to the conviction that only self-consciousness provides a means of validating any claims to personhood and membership in a community of free moral agents capable of responsibilities and worthy of rights.

In contrast to such an isolated and enclosed conception (i.e., whereby one is a person by virtue of being "set apart" from others as a privatized entity), Schmitz focuses upon an intimacy which presupposes a certain relation between persons. From this standpoint, intimacy is only possible through genuine self-disclosure, and the sharing of self-disclosure that allows for an intimate knowledge of the other.41 For Schmitz, such a revelation of one's inner self transcends any specific attributes or any overt capacity the individual might possess.42 Ultimately, Schmitz argues, intimacy is rooted in the unique act of presencing, whereby the person reveals his or her personal existence. But such a mystery only admits of a metphysical explanation, rather than an epistemological theory of meaning which confines itself to what is observable on the basis of perception or sense experience. Intimacy, then, discloses a level of being that transcends any distinctive properties. Because intimacy has a unique capacity to disclose being, it places us in touch with the very core of personhood. Metaphysically speaking, intimacy is not grounded in the recognition of this or that characteristic a person has, but rather in the simple unqualified presence the person is.43

**Case outweighs – neoliberalism now, no great power war**

#### Their impacts have causality in the wrong direction.

Ridley, visiting professor at Cold Spring Harbor Laboratory, former science editor of *The Economist*, and award-winning science writer, 2010

(Matt, *The Rational Optimist*, pg. 13-15)

If my fictional family is not to your taste, perhaps you prefer statistics. Since 1800, the population of the world has multiplied six times, yet **average life expectancy has more than doubled and real income has risen more than nine times**. Taking a shorter perspective, in 2005, compared with 1955, the average human being on Planet Earth earned nearly three times as much money (corrected for inflation), ate one-third more calories of food, buried one-third as many of her children and could expect to live one-third longer. She was less likely to die as a result of war, murder, childbirth, accidents, tornadoes, flooding, famine, whooping cough, tuberculosis, malaria, diphtheria, typhus, typhoid, measles, smallpox, scurvy or polio. She was less likely, at any given age, to get cancer, heart disease or stroke. She was more likely to be literate and to have finished school. She was more likely to own a telephone, a flush toilet, a refrigerator and a bicycle. All this during a half-century when the world population has more than doubled, so that far from being rationed by population pressure, the goods and services available to the people of the world have expanded. It is, by any standard, an astonishing human achievement. Averages conceal a lot. **But even if you break down the world into bits**, **it is hard to find any region that was worse off in 2005 than it was in 1955**. Over that half-century, real income per head ended a little lower in only six countries (Afghanistan, Haiti, Congo, Liberia, Sierra Leone and Somalia), life expectancy in three (Russia, Swaziland and Zimbabwe), and infant survival in none. In the rest they have rocketed upward. Africa’s rate of improvement has been distressingly slow and patchy compared with the rest of the world, and many southern African countries saw life expectancy plunge in the 1990s as the AIDS epidemic took hold (before recovering in recent years). There were also moments in the half-century when you could have caught countries in episodes of dreadful deterioration of living standards or life chances – China in the 1960s, Cambodia in the 1970s, Ethiopia in the 1980s, Rwanda in the 1990s, Congo in the 2000s, North Korea throughout. Argentina had a disappointingly stagnant twentieth century. But overall, after fifty years, **the outcome for the world is** remarkably, astonishingly, **dramatically positive**. The average South Korean lives twenty-six more years and earns fifteen times as much income each year as he did in 1955 (and earns fifteen times as much as his North Korean counter part). The average Mexican lives longer now than the average Briton did in 1955. The average Botswanan earns more than the average Finn did in 1955. **Infant mortality is lower today in Nepal than it was in Italy in 1951**. The proportion of Vietnamese living on less than $2 a day has dropped from 90 per cent to 30 per cent in twenty years. The rich have got richer, but the poor have done even better. **The poor in the developing world grew their consumption twice as fast as the world as a whole between 1980 and 2000**. The Chinese are ten times as rich, one-third as fecund and twenty-eight years longer-lived than they were fifty years ago. Even Nigerians are twice as rich, 25 per cent less fecund and nine years longer-lived than they were in 1955. **Despite a doubling of the world population**, even **the raw number of people living in absolute poverty** (defined as less than a 1985 dollar a day) **has fallen since the 1950s**. The percentage living in such absolute poverty has dropped by more than half – to less than 18 per cent. That number is, of course, still all too horribly high, but the trend is hardly a cause for despair: at the current rate of decline, it would hit zero around 2035 – though it probably won’t. The United Nations estimates that poverty was reduced more in the last fifty years than in the previous 500.

#### Their sweeping indicts of the energy system are wrong.

Richard Trzupek, Trinity Consultants, Principal, 2/14/13, The State of the Environment: Evaluating Progress and Priorities, Congressional Testimony, http://science.house.gov/hearing/subcommittee-environment-state-environment-evaluating-progress-and-priorities

The chasm between environmental perception and environmental reality, in other words, is huge and it’s growing larger every day. My testimony primarily focuses on two aspects of environmental policy: 1) the progress America has made in improving and protecting our environment, and 2) an analysis of selected, current environmental issues and initiatives, focusing on societal and economic costs, and ever-diminishing returns for increasingly puritanical and intrusive policies. Because my career has primarily involved air quality issues, I will examine that portion of the environmental picture in the most depth, in terms of both conventional air pollutants, toxic air pollutants and greenhouse gases. In addition, I will also discuss water quality, wetlands preservation and hydraulic fracturing of shale gas formations as well. Conventional Air Pollutants The progress we have made in reducing emissions of the six most common “criteria” air pollutants is both remarkable and undeniable. The following graphic, published by USEPA, illustrates that progress: A more detailed examination of the underlying data, also published by USEPA, shows that this reduction trend has been consistent in terms of both emissions of the individual air pollutants reduced and the time frame in which the reductions took place. The latter point is important, because a popular misconception is that America has had “pro-environment” and “antienvironment” administrations in power over the last forty years. Clearly, in terms of air pollution at least, this is not the case. Every administration since 1970 has been pro-active in protecting the environment. These emissions reductions have primarily been accomplished by the industrial sector in two ways: 1) by reducing the amount of air pollutants emitted in the industrial sector through the use of add-on controls, changes in work practices, raw material substitutions and other measures, and 2) by designing and producing increasingly cleaner engines and fuels used in the transportation sector of our economy. These reductions are reflected in the steady improvement in ambient air quality across the nation, as recorded by America’s extensive air quality monitoring network: Given this spectacular record of success, I am constantly amazed by the number of Americans of who are unaware the progress we have made in cleaning up the air. As I have interacted with everyday citizens in the course of public hearings for new projects and during speaking engagements, a surprising number of people – a large majority in fact – seem genuinely surprised to learn of these facts. In some cases, more stubborn individuals flatly refuse to believe them. Clearly, no one expects the average American to be an expert in finding and evaluating air quality data. This all-too-common impression that the United States is a dangerously polluted nation and is becoming more so must, therefore, be attributable to some other source or source(s). It is my impression that these false-impressions are primarily created by what I think of as America’s large and ever-growing risk industry, and these messages are then further perpetuated by individuals in the media and bloggers who have only the vaguest understanding of the underlying principals and issues. Unfortunately, the USEPA has become part of this disinformation machine, especially in the course of the last four years. By way of example, consider USEPA’s recently finalized “Boiler MACT” rule. This regulation primarily affects larger industrial (as opposed to utility) boilers that burn solid and/or liquid fuels. One of the positive aspects of this rule trumpeted by the Agency, environmental groups and media outlets is a reduction in “fine particulate” emissions (also known as PM-2.5 emissions) of 18,000 tons per year. Fine particulate matter has been linked to respiratory illnesses such as asthma. If research data shows that fine particulate matter contributes to respiratory illnesses, it follows that that a reduction in fine particulate matter emissions will result in a decrease in respiratory illnesses. Taking this another step further, the EPA then puts a price tag on avoided respiratory illnesses (and other illnesses) that will result from Boiler MACT implementation, claiming that while achieving these emissions reductions will cost industry $2.2 to $2.4 billion, the net national monetary benefit will come in somewhere around $13 to $29 per dollar invested. We’ll touch on this rather dubious accounting in a moment, but let’s first focus on the real magnitude of this emissions reduction. To the untutored, a reduction of 18,000 tons of anything per year seems significant, but what does that number really mean in terms of the real world? To find the answer, we again turn to EPA data, which summarizes the amount of fine particulate emissions from various types of sources. Looking at this table, it’s clear that today’s industrial sources are relatively small contributors to fine particulate emissions. Miscellaneous – a catch-all for all non-industrial, non-transportation sources (e.g.: consumer products, natural sources, etc). is the largest contributor by far. This is largely due to the fact that industrial and transportation sources have – as we have seen – made such massive reductions in emissions over the past four decades. The 18,000 ton per year reduction in fine particulate emissions from industrial boilers represents a 0.3% reduction in overall national fine particulate emissions of over 6 million tons per year. Is this a significant reduction? In my view it’s not, but whether or not one agrees, doesn’t a supposedly disinterested agency in the public service like the USEPA have an obligation to present this part of the picture as well, rather than steering us toward numbers with lots of zeros that mean nothing in a vacuum from a scientific point-of-view? Should not the Agency help put to rest the tired, old myth that it is industry – and industry alone – that is responsible for whatever contaminants find their way into the environment? Let’s return to those monetary benefit claims. Using the low end of the numbers presented by USEPA, a $2.2 billion investment will result in a $28.6 billion return. What a terrific result. But why stop there? If controlling a mere 18,000 tons per year of fine particulate matter can result in the generation of $26.4 billion in net income, what would happen if we controlled all 6.1 million tons per year of fine particulate matter? Using USEPA’s minimum cost effectiveness approach, we find that applying the same rate of return would generate $8.9 trillion per year in net revenue. We have thus solved America’s debt crisis. All we need to do is build a dome over the nation to keep every bit of fine particulate out and we’ll clear the national debt in two years. USEPA also claims that Boiler MACT implementation will result in the avoidance of 8,100 premature deaths per year. If we extend that peculiar logic, we find that control of all 6.1 million tons of fine particulate will avoid over 27 million premature deaths per year. The road to immortality apparently awaits. Obviously, these absurd conclusions cannot hold up to any scientific scrutiny. They are presented as one way to illustrate the way in which EPA’s regulatory analyses and justifications don’t make sense in any real world context. Absurd assumptions must necessarily result in absurd conclusions. The fact is that industrial sources of air pollution have been so successful in cleaning up their act that they represent less than half – and in some cases much less than half – of United States emissions of all of the criteria air pollutants, except for sulfur dioxide. Sources of criteria air pollutant sources, based on the latest USEPA National Emissions Inventory, are summarized in Appendix A, attached. The same themes hold true with respect to emissions of so-called “toxic air pollutants” (also known as “Hazardous Air Pollutants” or “HAPs”. The industrial contribution to the very, very small concentrations of HAPs present in the nation’s ambient air is not very significant in most cases, yet industrial sources are those most often vilified and targeted when toxic air pollutants are mentioned. Consider, for example, USEPA data identifying the sources of two readily recognizable air toxics: formaldehyde and benzene, both of which are on the USEPA’s list of regulated HAPs. The following two pie charts, showing the sources that contribute to ambient concentrations of formaldehyde and HAPs are taken from USEPA’s 2005 National Air Toxics Assessment. Released in 2011, this is the most recent National Air Toxic Assessment available. The data shows that the vast majority of emissions of these two pollutants emanates from natural sources (fires) and from transportation sources. America has spent a great deal of money and effort to reduce air toxics emissions, even though the average American is not exposed to dangerous concentrations of these compounds. The two examples referenced above are representative of the relative contributions of different sources for a great many air toxics. We simply do not have an air toxics problem in the United States today and, to the extent that anyone is unduly concerned by the small amounts of air toxics that exist in the atmosphere, industry should not continue to be the primary target of USEPA and environmental advocacy groups. Greenhouse Gases I would describe myself as a “global warming skeptic”, although I find those three words a gross oversimplification of a complex position. Like many other scientists, I believe that planet Earth has been going through a moderate warming cycle over the past few decades, one that appears to be leveling off. I also believe that human activities have made a contribution to that warming cycle, but I do not believe that the magnitude of that contribution is especially significant nor does it justify the imposition of expensive mitigation measures that would certainly have the most negative effects on the poorest segments of our global society. Having said that, I must admit that those who believe that both the recent warming trend and mankind’s contribution to it – sometimes designated “global warming alarmists” – have won the day, in the United States at least. We have made and will continue to make massive reductions in greenhouse gas emissions rates in the United States. I marvel that nobody in the EPA or in the employ of the big environmental advocacy groups will acknowledge – much lest celebrate – that simple truth. Instead prominent alarmists like former Vice President Al Gore continue to call for action as if completely unaware of all of the changes that have taken place and will continue to take place. According to USEPA data, emissions of GHG’s in 2010 (the last year for which a complete GHG inventory has been published) were down to levels that have not been seen since 1997. While America’s recent economic woes are surely in part responsible for this decrease, so has the continued implementation of Renewable Portfolio Standards (RPS) programs in over thirty individual states. When RPS implementation is combined with mass retirement of older, lessefficient coal-fired power plants and their replacement by less-carbon intensive natural gas fired power plants, it is clear that GHG emission rates in the United States will continue to drop. Water Quality Assessing the magnitude of the improvements in water quality that have been realized over the last forty years is a more difficult task than quantifying improvements in air quality. This is primarily because there are so many metrics for assessing water quality and the way that a particular water resource is used will factor into the evaluation as well. “Stream A”, used for recreational purposes, may be deemed to be healthy even though it contains the same amount of the same contaminants as “Stream B”, which supplies drinking water to neighboring communities. I do not mean to criticize this aspect of EPA’s water quality assessment effort. It seems reasonable and proper to factor in type(s) of usage when applying water quality standards. Doing so, however, makes it very difficult to clearly define the magnitude of improvement in United States water quality since the passage of the Clean Water Act. This is further complicated by the fact that water quality standards – just like air quality standards – have been repeatedly tightened over the years. However, there is little doubt that America has made great strides in improving the nation’s water quality. Rivers no longer catch on fire. Lakes once thought dead are sportsman’s paradises. The water quality “problems” we worry about today are issues that Americans in 1970 would have traded a limb to have, instead of dealing with the real ecological disasters of the time. Wetlands Preservation Since 1988, when the policy was first introduced by President George H.W. Bush, every administration has followed a “no net loss of wetlands” policy. This policy has been a huge success. With the exception of Gulf Coast tidal wetlands (as special case) wetlands in the United States have increased in acreage and improved in terms of quality. Many people, including myself, believe that wetlands program could stand with some improvements. At times, those who administer the program at the Army Corps of Engineers and in the EPA make petty determinations that are almost laughable. I have seen a pair of tires declared a wetland, for example and it several months of effort to get that ruling reversed. Arbitrary wetlands determinations have come into conflict with individual property rights as well. Yet, for all its flaws, the wetland policy articulated by the first President Bush remains another American, environmental success story. Hydraulic Fracturing Hydraulic fracturing of deep shale formations in order to collect natural gas, natural gas liquids and crude oil is not, as critics would have it, new, poorly understood technology. Hydraulic fracturing, also known by its slang name of “fracking”, has been around for over fifty years. The increased use of fracking in recent years is the result of two technological advances: 1) development of horizontal drilling techniques that allow for the economical recover of hydrocarbons in relatively shallow deep shale formations, and 2) new sensing techniques that allow energy companies to vastly improve their success rates when searching for energy deposits. Critics of the technique claim that the chemicals used in fracking are dangerous and could lead to contamination of aquifers. These are false, scientifically unsound conclusions. When a hole is drilled deep underground, for any purpose, it necessarily must pass through shallow aquifers, if such aquifers are present. The depth of aquifers used for drinking water vary, but 50 to 200 feet is typical in the United States. When the hole passes through the aquifer, an impermeable casing must be used to ensure that the materials used in drilling do not contaminate the aquifer. Again, this is the case whenever one drills deep, for any purpose. This would be the case, for example, if Carbon Storage and Sequestration ever becomes a viable way of controlling carbon dioxide emissions. Drilling also requires the use of very small concentrations of certain chemicals, such as corrosion inhibitors (to prevent metal oxidation) and anti-bacterials (to prevent biological growth and fouling). This has and will continue to be the case of any kind of deep well drilling. So, if a casing is poorly constructed, there is a chance that a small amount of certain, well-understood chemicals could seep out into an aquifer. That risk – tiny as it may be – will always exist as long as man uses drills to explore the earth and extract its resources. However, if the casing is properly installed, there is no way for any material used to extract shale gas lying a mile below the surface to seep into aquifers lying a couple of hundred feet down. The shale gas revolution is an American success story. A decade ago we were listening to dire predictions of natural gas shortages and the need to build LNG import terminals. Today, natural gas is abundant and cheap. Rather than talking about imports, American energy companies are preparing to export this valuable commodity overseas. This revolution has taken place safely and responsibly. It’s a revolution of which we should all be proud. Summary In my opinion, we have reached a point of diminishing returns such that we need to reassess the wisdom of continuing investment in environmental programs and regulation at the same rate that we have over the last forty-some years. In addition to the fact that America is now effectively controlling, minimizing and otherwise reducing the majority of pollutant emissions into the air, water and soil that had been largely uncontrolled in the run-up to modern environmental regulatory activity, the cost to further control, minimize and otherwise reduce the residual emissions that remain is disproportionately high. For example, all large industrial sources of particulate emissions in the United States are controlled. The days of smokestacks belching black soot are well behind us (which leads media outlets and environmental groups to publish pictures of smokestacks emitting steam as a way of visualizing “air pollution”). The vast majority of these large industrial sources use one of two well-established, reliable technologies to control particulate emissions: fabric filters (aka: baghouses) and electrostatic precipitators (ESP). Each of these technologies typically removes 99% + of particulate matter introduced into it. Controlling more than we control now would require either adding more ESPs and/or baghouses, or replacing these units with more exotic and expensive technologies. However, by definition, that additional expenditure would be much less cost effective. Generally speaking, if controlling the first 99% costs “X dollars/ton”, then controlling 99% of the remaining 1% will cost 10X dollars/ton, and controlling 99% of that residual will cost 100X dollars/ton, etc. If the EPA is going to remain relevant and most importantly – from its point of view fullyfunded, then it has felt the need to continually redefine its mission as environmental progress has accumulated. In the past, under administrations of both parties, this redefinition has consisted primarily of adopting increasingly more stringent standards for the air and the water. As long as the EPA has the ability and the authority to decide what the word “clean” means, it can ensure that the air and our waterways are eternally, officially “dirty”, no matter how much pollution is removed from each. A portion of the public and our elected representatives have caught on to the continual rolling back of the goal posts that is so central to current environmental policy-making. While it’s unlikely that enough people have become aware of this practice so as to endanger EPA funding, or that of the big environmental groups, any type of increased scrutiny is troubling to those invested in the risk industry. A new tactic was needed to justify ever more environmental purity in a pristine nation. The answer – the coming trend – is the equivalent of searching for needles in the midst of otherwise inoffensive haystacks. The EPA is moving from looking at the environment in the macroscopic sense to a new paradigm in which they put every single bit of the environment under a microscope. Doing so will accomplish a couple of things that will make both the Agency and environmental groups quite happy. It will certainly create a bevy of work in its own right. When you move from a model where the EPA uses representative sampling to assess environmental quality to one in which you search for individual hot spots, you create a massive amount of work. It’s the difference between conducting an opinion poll utilizing a statistically significant portion of the population and soliciting the opinion of every single citizen. In addition to the work that the search itself creates, it’s inevitable that this kind of intensive examination will yield fruitful results. When one puts anything under a microscope, one necessarily will find something ugly to gawk at. A magnifying device not only makes things look bigger, it also makes them seem more important than they really are. How will this new mission play out in practical terms over the next four years? Let’s consider one example. At a recent meeting of the Air and Waste Management Association, the new Director for Air and Radiation in EPA Region V, George Czerniak, proudly announced some new initiatives that would begin in 2013. One of these involve a new term: occult emissions. It’s an apt name, since finding them will involve many a witch hunt. According to the EPA, occult emissions are air pollution emissions that may (or may not) leak out of building from something other than the traditional smokestack. Let’s say that you operate a printing plant, for example. The solvents in the printing ink will be collected in a dryer, directed to a control device and destroyed very efficiently, thus preventing the solvents from contributing to smog formation. All of this happens according to applicable regulations and will be documented in the plant’s permit. But, even though well over 99 per cent of the solvents will be collected and destroyed, might there be a little bit that escapes? Perhaps through a window? Perhaps through a vent on a wall? It’s surely possible, even if that kind of tiny, incidental emission isn’t going to endanger anyone’s health or hurt mother earth in any way. But that’s exactly the sort of “occult emissions” that EPA will start searching for in 2013. Czerniak said that EPA inspectors would be looking for occult emissions with the aid of infrared cameras. These cameras identify sources of heat, not actual air pollution, and it will be easy to find heat escaping here and there is practically any building. No matter. These points will be viewed as potential sources of undocumented emissions and will therefore prompt further investigation. When the EPA identifies occult emissions that it perceives to be a problem, it will use its Clean Air Act enforcement authority and its general power to prevent “endangerment” of any sort to go after offenders. This too has become a bigger part of the EPA’s playbook in recent years. The threat of enforcement is enough to force action (justified or not), particularly when small to midsized companies that don’t have the resources to conduct protracted fights are involved. If that sounds an awful lot like environmental racketeering to you, well let’s just say that you wouldn’t be the first one to make that particular observation. There is, in summary, a big difference between solving problems and searching for problems to solve. As a nation, we have largely solved the environmental crisis that we faced half a century ago. It is time that we acknowledged that remarkable accomplishment and set ourselves upon a new course: one which will prevent us from ever returning to those dirty old days, but which also reflects the simple fact that any slight residual environmental and health risks to be addressed do not deserve the same level of time, attention or treasure as the big problems of yesteryear.

#### No impact – consensus

Taylor 12 (James, Forbes energy and environment writer, 3/14/2012, "Shock Poll: Meteorologists Are Global Warming Skeptics", www.forbes.com/sites/jamestaylor/2012/03/14/shock-poll-meteorologists-are-global-warming-skeptics/)

A recent survey of American Meteorological Society members shows meteorologists are skeptical that humans are causing a global warming crisis. The survey confirms what many scientists have been reporting for years; the politically focused bureaucratic leadership of many science organizations is severely out of touch with the scientists themselves regarding global warming issues. According to American Meteorological Society (AMS) data, 89% of AMS meteorologists believe global warming is happening, but only a minority (30%) is very worried about global warming. This sharp contrast between the large majority of meteorologists who believe global warming is happening and the modest minority who are nevertheless very worried about it is consistent with other scientist surveys. This contrast exposes global warming alarmists who assert that 97% of the world’s scientists agree humans are causing a global warming crisis simply because these scientists believe global warming is occurring. However, as this and other scientist surveys show, believing that some warming is occurring is not the same as believing humans are causing a worrisome crisis. Other questions solidified the meteorologists’ skepticism about humans creating a global warming crisis. For example, among those meteorologists who believe global warming is happening, only a modest majority (59%) believe humans are the primary cause. More importantly, only 38% of respondents who believe global warming is occurring say it will be very harmful during the next 100 years. With substantially fewer than half of meteorologists very worried about global warming or expecting substantial harm during the next 100 years, one has to wonder why environmental activist groups are sowing the seeds of global warming panic. Does anyone really expect our economy to be powered 100 years from now by the same energy sources we use today? Why immediately, severely, and permanently punish our economy with costly global warming restrictions when technological advances and the free market will likely address any such global warming concerns much more efficiently, economically and effectively? In another line of survey questions, 53% of respondents believe there is conflict among AMS members regarding the topic of global warming. Only 33% believe there is no conflict. Another 15% were not sure. These results provide strong refutation to the assertion that “the debate is over.” Interestingly, only 26% of respondents said the conflict among AMS members is unproductive. Overall, the survey of AMS scientists paints a very different picture than the official AMS Information Statement on Climate Change. Drafted by the AMS bureaucracy, the Information Statement leaves readers with the impression that AMS meteorologists have few doubts about humans creating a global warming crisis. The Information Statement indicates quite strongly that humans are the primary driver of global temperatures and the consequences are and will continue to be quite severe. Compare the bureaucracy’s Information Statement with the survey results of the AMS scientists themselves. Scientists who have attended the Heartland Institute’s annual International Conference on Climate Change report the same disconnect throughout their various science organizations; only a minority of scientists believes humans are causing a global warming crisis, yet the non-scientist bureaucracies publish position statements that contradict what the scientists themselves believe. Few, if any, of these organizations actually poll their members before publishing a position statement. Within this context of few actual scientist surveys, the AMS survey results are very powerful.

**No extinction**

Easterbrook 3(Gregg, senior fellow at the New Republic, “We're All Gonna Die!”, <http://www.wired.com/wired/archive/11.07/doomsday.html?pg=1&topic=&topic_set>=)

If we're talking about doomsday - the end of human civilization - many scenarios simply don't measure up. A single nuclear bomb ignited by terrorists, for example, would be awful beyond words, but life would go on. People and machines might converge in ways that you and I would find ghastly, but from the standpoint of the future, they would probably represent an adaptation. Environmental collapse might make parts of the globe unpleasant, but considering that the biosphere has survived ice ages, it wouldn't be the final curtain. Depression, which has become 10 times more prevalent in Western nations in the postwar era, might grow so widespread that vast numbers of people would refuse to get out of bed, a possibility that Petranek suggested in a doomsday talk at the Technology Entertainment Design conference in 2002. But Marcel Proust, as miserable as he was, wrote *Remembrance of Things Past* while lying in bed.

**Permutation—do the plan and deploy the alternative without rejecting the 1AC—it’s the best option.**

**Minteer**, Human Dimensions of Biology Faculty – School of Life Sciences @ Arizona State University, **‘5**

(Ben, “Environmental Philosophy and the Public Interest: A Pragmatic Reconciliation,” *Environmental Values* 14, p. 37–60)

This call for revisiting and rethinking the philosophical roots of Western culture, which for White were the techno-scientific worldview and its underlying religious and secular foundations in the medieval period, implied nothing less than an **overhaul** of the tradition, a **foundation-razing** process in which a new philosophy of science, technology, and nature – and perhaps a new, less arrogant relationship to the natural world – would be unearthed and absorbed into the modern worldview. Early environmental philosophers such as Routley and Rolston, then, apparently following White in their call for a new ethic able to account for the independent value of the natural world, assumed that the anthropocentric worldview (and its destructive instrumentalisation of nature) had to be replaced with a new, nonanthropocentric outlook. Here, Whiteʼs thesis about the anti-environmental implications of the Judeo-Christian religion, particularly his sweeping claim that the latter was ʻthe most anthropocentric religion the world has seenʼ, offered a point of departure for environmental philosophers, who would respond in subsequent years with a series of influential criticisms of the moral humanism of the Western philosophical inheritance (e.g., Taylor 1986, Rolston 1988, Callicott 1989, Westra 1994, Katz 1996). As the field matured in the 1980s and 1990s, an exclusivist non-anthropocentric agenda established itself as the dominant approach in the field, with a few notable exceptions (of the latter, see Norton 1984, 1991; Weston 1985, and Stone 1987). The result of these developments is that the public interest never became part of the agenda of environmental philosophy in the same way, for example, that it appears to have made lasting impressions in other branches of applied philosophy such as business, engineering, and biomedical ethics. Concerned with **what it perceived to be more pressing** and fundamental **questions of moral ontology** – that is, with the nature of environmental values and the moral standing of nonhuman nature – environmental philosophers pursued questions selfconsciously **cordoned off from parallel discussions** in mainstream moral and political theory, which were apparently deemed too anthropocentric to inform a philosophical field preoccupied with the separate issue of the moral considerability and significance of nonhuman nature. As a consequence, **instead of** (for example) **providing a** conceptual or analytic **framework for evaluating** cases, practices, and **policies** from the perspective of ostensibly ʻhuman-centredʼ concepts such as the public interest, many environmental philosophers preferred to focus exclusively on the independent status of natural values. I would argue that this original failure to link environmental values and claims to recognised moral and political concerns also **helps to explain** the relative **inability of environmental philosophy to have a significant impact within public and private institutions** over the years, again, especially when compared with other applied ethics counterparts. Environmental philosophy is and always has been concerned with ʻnatureʼs interestʼ, not that of the public. This situation has also produced a number of unfortunate consequences for the contribution of environmental philosophy to **policy discussion and debate**, not to mention more **concrete** and on-the-ground forms of **social action.** One example here is the largely missed opportunity for philosophers to study and contribute to some of the more important environmental reform movements and institutional initiatives of the past three decades. Chief among these developments, perhaps, is the public interest movement that developed alongside environmental ethics in the late 1960s and early 1970s, which united consumer protection with environmental advocacy through organisations like Ralph Naderʼs Public Interest Research Groups (PIRGs). This list of emerging direct-action environmental movements would also have to include the growing number of grassroots organisations and groups, commonly lumped under the ʻenvironmental justiceʼ banner, which have sought to link the concerns of public health, safety, and community well-being to environmental protection through the language and tactics of social justice and civil rights (Gottlieb 1993, Shutkin 2000, Shrader-Frechette 2002). Had environmental philosophy worked a serious notion of the public interest into its agenda, it doubtless would have been (and would now be) much more engaged with these influential movements in citizen environmental action, not to mention a range of discussions in areas such as risk communication, pollution prevention and regulatory reform, public understanding of science, and so on.

**Total rejection fragments resistance –perm solves best**

J.K. **Gibson-Graham**, feminist economist, **96**, End of Capitalism

One of our goals as Marxists has been to produce a knowledge of capitalism. Yet as “that which is known,” Capitalism has become the intimate enemy. We have uncloaked the ideologically-clothed, obscure monster, but we have installed a naked and visible monster in its place. In return for our labors of creation, the monster has robbed us of all force. We hear – and find it easy to believe – that the left is in disarray. Part of what produces the disarray of the left is the vision of what the left is arrayed against. When capitalism is represented as a unified system coextensive with the nation or even the world, when it is portrayed as crowding out all other economic forms, when it is allowed to define entire societies, it becomes something that can only be defeated and replaced by a mass collective movement (or by a process of systemic dissolution that such a movement might assist). The revolutionary task of replacing capitalism now seems outmoded and unrealistic, yet we do not seem to have an alternative conception of class transformation to take its place. The old political economic “systems” and “structures” that call forth a vision of revolution as systemic replacement still seem to be dominant in the Marxist political imagination. The New World Order is often represented as political fragmentation founded upon economic unification. In this vision the economy appears as the last stronghold of unity and singularity in a world of diversity and plurality. But why can’t the economy be fragmented too? If we theorized it as fragmented in the United States, we could being to see a huge state sector (incorporating a variety of forms of appropriation of surplus labor), a very large sector of self-employed and family-based producers (most noncapitalist), a huge household sector (again, quite various in terms of forms of exploitation, with some households moving towards communal or collective appropriation and others operating in a traditional mode in which one adult appropriates surplus labor from another). None of these things is easy to see. If capitalism takes up the available social space, there’s no room for anything else. If capitalism cannot coexist, there’s no possibility of anything else. If capitalism functions as a unity, it cannot be partially or locally replaced. My intent is to help create the discursive conception under which socialist or other noncapitalist construction becomes “realistic” present activity rather than a ludicrous or utopian goal. To achieve this I must smash Capitalism and see it in a thousand pieces. I must make its unity a fantasy, visible as a denial of diversity and change.

#### Adaptability takes out the alt and makes capitalism sustainable.

Kaletsky ’10

Anatole, Masters in Economics from Harvard, Honour-Degree Graduate at King’s College and Cambrdige, editor-at-large of The Times of London, founding partner and chief economist of GaveKal Capital, He is on the governing board of the New York– based Institute for New Economic Theory (INET), a nonprofit created after the 2007– 2009 crisis to promote and finance academic research in economics outside the orthodoxy of “efficient markets.” From 1976 to 1990, Kaletsky was New York bureau chief and Washington correspondent of the Financial Times and a business writer on The Economist, “Capitalism 4 0: The Birth of a New Economy in the Aftermath of Crisis,” AM

The world did not end. Despite all the forebodings of disaster in the 2007– 09 financial crisis, the first decade of the twenty-first century passed rather uneventfully into the second. The riots, soup kitchens, and bankruptcies predicted by many of the world’s most respected economists did not materialize— and no one any longer expects the global capitalist system to collapse, whatever that emotive word might mean. Yet the capitalist system’s survival does not mean that the precrisis faith in the wisdom of financial markets and the efficiency of free enterprise will ever again be what it was before the bankruptcy of Lehman Brothers on September 15, 2008. A return to decent economic growth and normal financial conditions is likely by the middle of 2010, but will this imply a return to business as usual for politicians, economists, and financiers? Although globalization will continue and many parts of the world will gradually regain their prosperity of the precrisis period, the traumatic effects of 2007– 09 will not be quickly forgotten. And the economic costs will linger for decades in the debts squeezing taxpayers and government budgets, the disrupted lives of the jobless, and the vanished dreams of homeowners and investors around the world. For what collapsed on September 15, 2008, was not just a bank or a financial system. What fell apart that day was an entire political philosophy and economic system, a way of thinking about and living in the world. The question now is what will replace the global capitalism that crumbled in the autumn of 2008. The central argument of this book is that global capitalism will be replaced by nothing other than global capitalism. The traumatic events of 2007– 09 will neither destroy nor diminish the fundamental human urgesthat have always powered the capitalist system— ambition, initiative, individualism, the competitive spirit. These natural human qualities will instead be redirected and reenergized to create a new version of capitalismthat will ultimately be even more successful and productive than the system it replaced. To explain this process of renewal, and identify some of the most important features of the reinvigorated capitalist system, is the ambition of this book. This transformation will take many years to complete, but some of its consequences can already be discerned. With the benefit of even a year’s hindsight, it is clear that these consequences will be different from the nihilistic predictions from both ends of the political spectrum at the height of the crisis. On the Left, anticapitalist ideologues seemed honestly to believe that a few weeks of financial chaos could bring about the disintegration of a politico-economic system that had survived two hundred years of revolutions, depressions, and world wars. On the Right, free-market zealots insisted that private enterprise would be destroyed by government interventions that were clearly necessary to save the system— and many continue to believe that the crisis could have been resolved much better if governments had simply allowed financial institutions to collapse. A balanced reassessment of the crisis must challenge both left-wing hysteria and right-wing hubris. Rather than blaming the meltdown of the global financial system on greedy bankers, incompetent regulators, gullible homeowners, or foolish Chinese bureaucrats, this book puts what happened into historical and ideological perspective. It reinterprets the crisis in the context of the economic reforms and geopolitical upheavals that have repeatedly transformed the nature of capitalism since the late eighteenth century, most recently in the Thatcher-Reagan revolution of 1979– 89. The central argument is that capitalism has never been a static system that follows a fixed set of rules, characterized by a permanent division of responsibilities between private enterprise and governments. Contrary to the teachings of modern economic theory, no immutable laws govern the behavior of a capitalist economy. Instead, capitalism is an adaptive social system that mutates and evolves in response to a changing environment. When capitalism is seriously threatened by a systemic crisis, a new version emerges that is better suited to the changing environment and replaces the previously dominant form. Once we recognize that capitalism is not a static set of institutions, but an evolutionary system that reinvents and reinvigorates itself through crises, we can see the events of 2007– 09 in another light: as the catalyst for the fourth systemic transformation of capitalism, comparable to the transformations triggered by the crises of the 1970s, the crises of the 1930s, and the Napoleonic Wars of 1803– 15. Hence the title of this book.

**No limits to growth—tech and demographics solve—star this card.**

**Bisk ’12**

Tsvi, American Israeli futurist; director of the Center for Strategic Futurist Thinking and contributing editor for strategic thinking for The Futurist magazine. He is the author of The Optimistic Jew: A Positive Vision for the Jewish People in the 21st Century. Norwich University MA, Political History Thomas Edison State College BA, Social Sciences, 500 published articles, “No Limits to Growth,” <https://www.wfs.org/Upload/PDFWFR/WFR_Spring2012_Bisk.pdf>, AM

The Case for No Limits to Growth Notwithstanding all of the above, I want to reassert that by imagineering an alternative future—based on solid science and technology— we can create a situation in which there are “no limits to growth.” It begins with a new paradigm for food production **now under development**: the urban vertical farm. This is a concept popularized by Prof. Dickson Despommier of Columbia University.30 A 30-story urban vertical farm located on five square acres could yield food **for fifty thousand people**. We are talking about high-tech installations that would multiply productivity by a factor of 480: four growing seasons, times twice the density of crops, times two growing levels on each floor, times 30 floors = 480. This means that **five acres** of land can **produce the equivalent of 2,600 acres of conventionally planted and tended crops**. Just 160 such buildings occupying only 800 acres could feed the entire city of New York. Given this calculus, **an area the size of Denmark could feed the entire human race**. Vertical farms would be self-sustaining. Located contiguous to or inside urban centers, they could also contribute to urban renewal. They would be urban lungs, improving the air quality of cities. They would produce a varied food supply year-round. They would **use 90% less water.** Since agriculture consumes two-thirds of the water worldwide, mass adoption of this technology would solve humanity’s water problem. Food would no longer need to be transported to market; it would be produced at the market and would not require use of petroleum intensive agricultural equipment. This, **along with lessened use of pesticides, herbicides and fertilizers,** would not only be better for the environment but would eliminate agriculture’s dependence on petroleum and **significantly reduce petroleum demand**. Despite increased efficiencies, direct (energy) and indirect (fertilizers, etc.) energy use represented over 13% of farm expenses in 2005-2008 and have been increasing as the price of oil rises.31 Many of the world’s damaged ecosystems would be repaired by the consequent abandonment of farmland. A “**rewilding”** of our planet would take place. Forests, jungles and savannas would reconquer nature, increasing habitat and becoming giant CO2 “sinks,” sucking up the excess CO2 that the industrial revolution has pumped into the atmosphere. Countries **already investigating** the adoption of such technology include Abu Dhabi, Saudi Arabia, South Korea, and China—countries that are water starved or highly populated. Material Science, Resources and Energy The embryonic revolution in material science now taking place is the key to “no limits to growth.” I refer to “smart” and superlight materials. Smart materials “are materials that have one or more properties that can be significantly changed in a controlled fashion by external stimuli.” 32 They can produce energy by exploiting differences in temperature (thermoelectric materials) or by being stressed (piezoelectric materials). Other smart materials save energy in the manufacturing process by changing shape or repairing themselves as a consequence of various external stimuli. These materials have all passed the “**proof of concept**” phase (i.e., are scientifically sound) and many are in the prototype phase. Some are **already commercialized and penetrating the market**. For example, the Israeli company Innowattech has underlain a one-kilometer stretch of local highway with piezoelectric material to “harvest” the wasted stress energy of vehicles passing over and convert it to electricity.33 They reckon that Israel has stretches of road that can efficiently produce 250 megawatts. If this is verified, consider the tremendous electricity potential of the New Jersey Turnpike or the thruways of Los Angeles and elsewhere. Consider the potential of railway and subway tracks. We are talking about tens of thousands of potential megawatts produced without any fossil fuels. Additional energy is derivable from thermoelectric materials, which can transform wasted heat into electricity. As Christopher Steiner notes, capturing waste heat from manufacturing alone in the United States would provide an additional 65,000 megawatts: “enough for 50 million homes.”34 **Smart glass** is already commercialized and can save significant energy in heating, airconditioning and lighting—up to 50% saving in energy has been achieved in retrofitted legacy buildings (such as the former Sears Tower in Chicago). New buildings, designed to take maximum advantage of this and other technologies could save even more. Buildings consume 39% of America’s energy and 68% of its electricity. They emit 38% of the carbon dioxide, 49% of the sulfur dioxide, and 25% of the nitrogen oxides found in the air.35 Even greater savings in electricity could be realized by replacing incandescent and fluorescent light bulbs with LEDS which use 1/10th the electricity of incandescent and half the electricity of fluorescents. These three steps: transforming waste heat into electricity, retrofitting buildings with smart glass, and LED lighting, could cut America’s electricity consumption and its **CO2 emissions by 50% within 10 years.** They would also generate hundreds of thousands of jobs in construction and home improvements. Coal driven electricity generation would become a thing of the past. The coal released could be liquefied or gasified (by new environmentally friendly technologies) into the energy equivalent of 3.5 million barrels of oil a day. This is equivalent to the amount of oil the United States imports from the Persian Gulf and Venezuela together.36 Conservation of energy and parasitic energy harvesting, as well as urban agriculture would cut the planet’s energy consumption and air and water pollution significantly. **Waste-to-energy technologies could begin to replace fossil fuels**. Garbage, sewage, organic trash, and agricultural and food processing waste are essentially hydrocarbon resources that can be transformed into ethanol, methanol, and biobutanol or biodiesel. These can be used for transportation, electricity generation or as feedstock for plastics and other materials. Waste-to-energy is essentially a recycling of CO2 from the environment instead of introducing new CO2 into the environment. Waste-to-energy also prevents the production, and release from rotting organic waste, of **methane**—a greenhouse gas 25 times more powerful than CO2. Methane accounts for 18% of the manmade greenhouse effect. Not as much as CO2, which constitutes 72%, but still considerable (landfills emit as much greenhouse gas effect, in the form of methane, as the CO2 from all the vehicles in the world). Numerous prototypes of a variety of waste-to-energy technologies are already in place. When their declining costs meet the rising costs of fossil fuels, they will become commercialized and, if history is any judge, will replace fossil fuels **very quickly**—just as coal replaced wood in a matter of decades and petroleum replaced whale oil in a matter of years. Superlight Materials But it is superlight materials that have the greatest potential to transform civilization and, in conjunction with the above, to usher in the “no limits to growth” era. I refer, in particular, to car-bon nanotubes—alternatively referred to as Buckyballs or Buckypaper (in honor of Buckminster Fuller). Carbon nanotubes are between 1/10,000th and 1/50,000th the width of a human hair, more flexible than rubber and 100-500 times stronger than steel per unit of weight. Imagine the energy savings if planes, cars, trucks, trains, elevators—everything that needs energy to move—were made of this material and weighed 1/100th what they weigh now. Imagine the types of alternative energy that would become practical. Imagine the positive impact on the environment: replacing many industrial processes and mining, and thus lessening air and groundwater pollution. Present costs and production methods make this impractical but that infinite resource—the human mind—has confronted and solved many problems like this before. Let us take the example of aluminum. A hundred fifty years ago, aluminum was more expensive than gold or platinum.37 When Napoleon III held a banquet, he provided his most honored guests with aluminum plates. Less-distinguished guests had to make do with gold! When the Washington Monument was completed in 1884, it was fitted with an aluminum cap—the most expensive metal in the world at the time—as a sign of respect to George Washington. It weighed 2.85 kilograms, or 2,850 grams. Aluminum at the time cost $1 a gram (or $1,000 a kilogram). A typical day laborer working on the monument was paid $1 a day for 10-12 hours a day. In other words, today’s common soft-drink can, which weighs 14 grams, could have bought 14 ten-hour days of labor in 1884.38 Today’s U.S. minimum wage is $7.50 an hour. Using labor as the measure of value, a soft drink can would cost $1,125 today (or $80,000 a kilogram), were it not for a new method of processing aluminum ore. The Hall-Héroult process turned aluminum into one of the cheapest commodities on earth only two years after the Washington Monument was capped with aluminum. Today aluminum costs $3 a kilogram, or $3000 a metric ton. The soft drink can that would have cost $1,125 today without the process now costs $0.04. Today the average cost of industrial grade carbon nanotubes is about $50-$60 a kilogram. This is already far cheaper in real cost than aluminum was in 1884. Yet revolutionary methods of production are now being developed that will drive costs down even more radically. At Cambridge University they are working on a new electrochemical production method that could produce 600 kilograms of carbon nanotubes **per day** at a projected cost of around $10 a kilogram, or $10,000 a metric ton.39 This will do for carbon nanotubes what the Hall-Héroult process did for aluminum. **Nanotubes will become the universal raw material of choice**, displacing steel, aluminum, copper and other metals and materials. Steel presently costs about $750 per metric ton. Nanotubes of equivalent strength to a metric ton of steel would cost $100 if this Cambridge process (or others being pursued in research labs around the world) proves successful. Ben Wang, director of Florida State’s High Performance Materials Institute claims that: “If you take just one gram of nanotubes, and you unfold every tube into a graphite sheet, you can cover about two-thirds of a football field”.40 Since other research has indicated that carbon nanotubes would be more suitable than silicon for producing **p**hoto**v**oltaic energy, consider the implications. Several grams of this material could be the energy-producing skin for new generations of superlight dirigibles—making these airships energy autonomous. They could replace airplanes as the primary means to transport air freight. Modern American history has shown that anything human beings decide they want done can be done in 20 years if it does not violate the laws of nature. The atom bomb was developed in four years; putting a man on the moon took eight years. It is a reasonable conjecture that **by 2020 or earlier**, **an industrial process for the inexpensive production of carbon nanotubes will be developed**, and that this would be the key to solving our energy, raw materials, and environmental problems all at once. Mitigating Anthropic Greenhouse Gases Another vital component of a “no limits to growth” world is to formulate a rational environmental policy that saves money; one that would gain wide grassroots support because it would benefit taxpayers and businesses, and would not endanger livelihoods. For example, what do sewage treatment, garbage disposal, and fuel costs amount to as a percentage of municipal budgets? What are the costs of waste disposal and fuel costs in stockyards, on poultry farms, throughout the food processing industry, and in restaurants? How much aggregate energy could be saved from all of the above? Some experts claim that we could obtain enough liquid fuel from recycling these hydrocarbon resources to satisfy all the transportation needs of the United States. Turning the above waste into energy by various means would be a huge cost saver and value generator, in addition to being a blessing to the environment. The U.S. army has developed a portable field apparatus that turns a combat unit’s human waste and garbage into bio-diesel to fuel their vehicles and generators.41 It is called TGER—the Tactical Garbage to Energy Refinery. It eliminates the need to transport fuel to the field, thus saving lives, time, and equipment expenses. The cost per barrel must still be very high. However, the history of military technology being civilianized and revolutionizing accepted norms is long. We might expect that **within 5-10 years**, economically competitive units using similar technologies will appear in restaurants, on farms, and perhaps even in individual households, turning organic waste into usable and economical fuel. We might conjecture that within several decades, centralized sewage disposal and garbage collection will be things of the past and that even the Edison Grid (unchanged for over one hundred years) **will be deconstructed**. The Promise of Algae Biofuels produced from algae could eventually provide a substantial portion of our transportation fuel. Algae has a much higher productivity potential than crop-based biofuels because it grows faster, uses less land and requires only sun and CO2 plus nutrients that can be provided from gray sewage water. It is the primo CO2 sequesterer because it works for free (by way of photosynthesis), and in doing so produces biodiesel and ethanol in much higher volumes per acre than corn or other crops. Production costs are the biggest remaining challenge. One Defense Department estimate pins them at more than $20 a gallon.42 But once commercialized in industrial scale facilities, production cost could go as low as $2 a gallon (the equivalent of $88 per barrel of oil) according to Jennifer Holmgren, director of renewable fuels at an energy subsidiary of Honeywell International.43 Since algae uses waste water and CO2 as its primary feedstock, its use to produce transportation fuel or feedstock for product would actually improve the environment. The Promise of the Electric Car There are 250 million cars in the United States. Let’s assume that they were all fully electric vehicles (EVs) equipped with 25-kWh batteries. Each kWh takes a car two to three miles, and if the average driver charges the car twice a week, this would come to about 100 charge cycles per year. All told, Americans would use 600 billion kWh per year, which is only 15% of the current total U.S. production of 4 trillion kWh per year. If supplied during low demand times, this would not even require additional power plants. If cars were made primarily out of Buckypaper, one kWh might take a car 40-50 miles. If the surface of the car was utilized as a photovoltaic, the car of the future might conceivably become **energy autonomous** (or at least semi-autonomous). A kWh produced by a coal-fired power plant creates two pounds of CO2, so our car-related CO2 footprint would be 1.2 trillion pounds if all electricity were produced by coal. However, burning one gallon of gas produces 20 pounds of CO2.44 In 2008, the U.S. used 3.3 billion barrels of gasoline, thereby creating about 3 trillion pounds of CO2. Therefore, a switch to electric vehicles would cut CO2 emissions by 60% (from 3 trillion to 1.2 trillion pounds), even if we burned coal exclusively to generate that power. Actually, replacing a gas car with an electric car will cause zero increase in electric draw because refineries use seven kWh of power to refine crude oil into a gallon of gasoline. A Tesla Roadster can go 25 miles on that 7 KWh of power. So the electric car can go 25 miles using the same electricity needed to refine the gallon of gas that a combustion engine car would use to go the same distance. Additional Strategies The goal of mitigating global warming/climate change without changing our lifestyles is not naïve. Using proven Israeli expertise, planting forests on **just 12%** of the world’s semi-arid areas would offset the annual CO2 output of **one thousand 500-megawatt coal plants** (a gigaton a year).45 A global program of foresting 60% of the world’s semi-arid areas **would offset five thousand 500-megawatt coal plants** (five gigatons a year). Since mitigation goals for global warming include reducing our CO2 emissions by eight gigatons by 2050, this project alone would have a tremendous ameliorating effect. Given that large swaths of semi-arid land areas contain or border on some of the poorest populations on the planet, we could put millions of the world’s poorest citizens to work in forestation, thus accomplishing two positives (fighting poverty and environmental degradation) with one project. Moving agriculture from its current fieldbased paradigm to vertical urban agriculture would eliminate **two gigatons of CO2.** The subsequent re-wilding of vast areas of the earth’s surface could help sequester up to **50 gigatons of CO2 a year**, completely reversing the trend. The revolution underway in material science will help us to become “self-sufficient” in energy. It will also enable us to create superlight vehicles and structures that will produce their own energy. Over time, carbon nanotubes will replace steel, copper and aluminum in a myriad of functions. Converting waste to energy will eliminate most of the methane gas humanity releases into the atmosphere. Meanwhile, artificial photosynthesis will suck CO2 out of the air at 1,000 times the rate of natural photosynthesis.46 This trapped CO2 could then be combined with hydrogen to create much of the petroleum we will continue to need. As hemp and other fast-growing plants replace wood for making paper, the logging industry will largely cease to exist. Self-contained fish farms will provide a major share of our protein needs with far less environmental damage to the oceans. Population Explosion or Population Implosion One constant refrain of anti-growth advocates is that we are heading towards 12 billion people by the end of the century, that this is unsustainable, and thus that we must proactively reduce the human population to 3 billion-4 billion in order to “save the planet” and human civilization from catastrophe. But recent data indicates that a **demographic winter** will engulf humanity by the middle of this century. More than 60 countries (containing over half the world’s population) already do not have replacement birth rates of 2.1 children per woman. This includes the entire EU, China, Russia, and half a dozen Muslim countries, including Turkey, Algeria, and Iran. If present trends continue, India, Mexico and Indonesia will join this group before 2030. The human population will peak at 9-10 billion by 2060, after which, for the first time since the Black Death, it will begin to shrink. By the end of the century, the human population might be as low as 6 billion-7 billion. The real danger is not a population explosion; but the consequences of the impending population implosion.47 This demographic process is not being driven by famine or disease as has been the case in all previous history. Instead, it is being driven by the greatest Cultural Revolution in the history of the human race: the **liberation and empowerment of women**. The fact is that even with **present technology**, we would still be able to sustain a global population of 12 billion by the end of the century if needed. The evidence for this is cited above.

**The alt fails**

**Kliman**, professor of economics – Pace University, **‘4**

(Andrew, “Alternatives to Capitalism: What Happens After the Revolution?” http://akliman.squarespace.com/writings/)

I. Concretizing the Vision of a New Human Society We live at a moment in which it is harder than ever to articulate a liberatory alternative to capitalism. As we all know, the collapse of state-capitalist regimes that called themselves “Communist,” as well as the widespread failures of social democracy to remake society, have given rise to a widespread acceptance of Margaret Thatcher’s TINA – the belief that “there is no alternative.” Yet the difficulty in articulating a liberatory alternative is not mostly the product of these events. It is an inheritance from the past. To what extent has such an alternative ever been articulated? There has been a lot of progress – in theory and especially in practice – on the problem of forms of organization – but new organizational forms by themselves are not yet an alternative. A great many leftists, even revolutionaries, did of course regard nationalized property and the State Plan, under the control of the “vanguard” Party, as socialism, or at least as the basis for a transition to socialism. But even before events refuted this notion, it represented, at best, an evasion of the problem. It was largely a matter of leftists with authoritarian personalities subordinating themselves and others to institutions and power with a **blind faith** that substituted for thought. How such institutions and such power would result in human liberation was never made clear. **Vague references to “transition” were used to wave the problem away**. Yet as Marxist-Humanism has stressed for more than a decade, the anti-Stalinist left is also partly responsible for the crisis in thought. It, too, failed to articulate a liberatory alternative, offering in place of private- and state-capitalism little more than what Hegel (Science of Logic, Miller trans., pp. 841-42) called “the **empty negative** … a **presumed absolute**”: The impatience that insists merely on getting beyond the determinate … and finding itself immediately in the absolute, has before it as cognition nothing but the empty negative, the abstract infinite; in other words, a presumed absolute, that is presumed because it is not posited, not grasped; grasped it can only be through the mediation of cognition … . The question that confronts us nowadays is whether we can do better. Is it possible to make the vision of a new human society more concrete and determinate than it now is, through the mediation of cognition? According to a long-standing view in the movement, it is not possible. The character of the new society can only be concretized by practice alone, in the course of trying to remake society. Yet if this is true, we are faced with a viciouscircle from which there seems to be no escape, because acceptance of TINA is creating barriers in practice. In the **perceived** absence of an alternative, practical struggles have proven to be **self-limiting at best**. They stop short of even trying to remake society totally – and for good reason. As Bertell Ollman has noted (Introduction to Market Socialism: The Debate among Socialists, Routledge, 1998, p. 1), “People who believe [that there is no alternative] will put up with almost any degree of suffering. Why bother to struggle for a change that cannot be? … people [need to] have a good reason for choosing one path into the future rather than another.” Thus the reason of the masses is posing a new challenge to the movement from theory. When masses of people require reasons before they act, a new human society surely cannot arise through spontaneous action alone. And **exposing the ills of** existing **society does not provide sufficient reason for action when what is at issue is the very possibility of an alternative**. If the movement from theory is to respond adequately to the challenge arising from below, it is necessary to abandon the presupposition – and it seems to me to be no more than a presupposition – that the vision of the new society cannot be concretized through the mediation of cognition**.** We need to take seriously Raya Dunayevskaya’s (Power of Negativity [PON], p. 184) claim in her Hegel Society of America paper that “There is no trap in thought. Though it is finite, it breaks through the barriers of the given, reaches out, if not to infinity, surely beyond the historic moment” (RD, PON, p. 184). This, too, is a presupposition that can be “proved” or “disproved” **only in the light of the results it yields**. In the meantime, the challenges from below require us to proceed on its basis.

**Transition backfires.**

Monbiot, 9

George Monbiot, The Guardian, 2009, Is there any point in fighting to stave off industrial apocalypse?, [www.guardian.co.uk/commentisfree/cif-green/2009/aug/17/environment-climate-change](http://www.guardian.co.uk/commentisfree/cif-green/2009/aug/17/environment-climate-change)

I detect in your writings, and in the conversations we have had, an attraction towards – almost a yearning for – this apocalypse, a sense that you see it as a cleansing fire that will rid the world of a diseased society. If this is your view, I do not share it. I'm sure we can agree that the immediate consequences of collapse would be hideous: the breakdown of the systems that keep most of us alive; mass starvation; war. These alone surely give us sufficient reason to fight on, however faint our chances appear. But even if we were somehow able to put this out of our minds, I believe that what is likely to come out on the other side will be worse than our current settlement. Here are three observations: 1 Our species (unlike most of its members) is tough and resilient; 2 When civilisations collapse, psychopaths take over; 3 We seldom learn from others' mistakes. From the first observation, this follows: even if you are hardened to the fate of humans, you can surely see that our species will not become extinct without causing the extinction of almost all others. However hard we fall, we will recover sufficiently to land another hammer blow on the biosphere. We will continue to do so until there is so little left that even Homo sapiens can no longer survive. This is the ecological destiny of a species possessed of outstanding intelligence, opposable thumbs and an ability to interpret and exploit almost every possible resource – in the absence of political restraint. From the second and third observations, this follows: instead of gathering as free collectives of happy householders, survivors of this collapse will be subject to the will of people seeking to monopolise remaining resources. This will is likely to be imposed through violence. Political accountability will be a distant memory. The chances of conserving any resource in these circumstances are approximately zero. The human and ecological consequences of the first global collapse are likely to persist for many generations, perhaps for our species' remaining time on earth. To imagine that good could come of the involuntary failure of industrial civilisation is also to succumb to denial. The answer to your question – what will we learn from this collapse? – is nothing.

**Every empirical example proves.**

**Anderson**, professor of sociology – UCLA, **’84**

(Perry, In the tracks of historical materialism, p. 102-103)

That background also indicates, however, what is essentially missing from his work. How are we to get from where we are today to where he point us to tomorrow? There is no answer to this question in Nove. His halting discussion of “transition” tails away into apprehensive admonitions to moderation to the British Labor Party, and pleas for proper compensation to capitalist owners of major industries, if these are to be nationalized. Nowhere is there any sense of what a titanic political change would have to occur, with what fierceness of social struggle, for the economic model of socialism he advocates ever to materialize. Between the radicalism of the future end-state he envisages, and the conservatism of the present measures he is prepared to countenance, there is an unbridgeable abyss. How could private ownership of the means of production ever be abolished by policies less disrespectful of capital than those of Allende or a Benn, which he reproves? What has disappeared from the pages of The Economics of Feasible Socialism is virtually all attention to the historical dynamics of any serious conflict over the control of the means of production, as the record of the 20th century demonstrates them. If capital could visit such destruction on even so poor and small an outlying province of its empire in Vietnam, to prevent its loss, is it likely that it would suffer its extinction meekly in its own homeland? The lessons of the past sixty-five years or so are in this respect **without ambiguity or exception**, **there is no case**, from **Russia** to **China**, from **Vietnam** to **Cuba**, from **Chile** to **Nicaragua**, where the existence of capitalism has been challenged, and the furies of intervention, blockade and civil strife have not descended in response. Any viable transition to socialism in the West must seek to curtail that pattern: **but to** shrink from or to **ignore it is to depart from the world of the possible altogether**. In the same way, to construct an economic model of socialism in one advanced country is a legitimate exercise: but to extract it from any computable relationship with a surrounding, and necessarily opposing, capitalist environment—as this work does—is to locate it in thin air.

**Capitalism solves war**

**Gartzke 7** (Eric, associate professor of political science and a member of the Saltzman Institute of War and Peace Studies at Columbia University, “The Capitalist Peace”, American Journal of Political Science, Vol. 51, No. 1, January 2007, Pp. 166–191)

If war is a product of incompatible interests and failed or abortive bargaining, peace ensues when states lack differences worthy of costly conflict, or when circumstances favor successful diplomacy. Realists and others argue that state interests are inherently incompatible, but this need be so only if state interests are narrowly defined or when conquest promises tangible benefits. Peace can result from at least three attributes of mature capitalist economies. First, the historic impetus to territorial expansion is tempered by the rising importance of intellectual and financial capital, factors that are more expediently enticed than conquered. Land does little to increase the worth of the advanced economies while resource competition is more cheaply pursued through markets than by means of military occupation. At the same time, development actually increases the ability of states to project power when incompatible policy objectives exist. Development affects who states fight (and what they fight over) more than the overall frequency of warfare. Second, substantial overlap in the foreign policy goals of developed nations in the post–World War II period further limits the scope and scale of conflict. Lacking territorial tensions, consensus about how to order the international system has allowed liberal states to cooperate and to accommodate minor differences. Whether this affinity among liberal states will persist in the next century is a question open to debate. Finally, the rise of global capital markets creates a new mechanism for competition and communication for states that might otherwise be forced to fight. Separately, these processes influence patterns of warfare in the modern world. Together, they explain the absence of war among states in the developed world and account for the dyadic observation of the democratic peace.

#### Specificity matters – rejecting neoliberalism as a monolithic entity undermines the alt

Duffy and Moore 10

Article: Neoliberalizing nature? Elephants as imperfect commodities Author: Duffy, R Journal: Antipode ISSN: 0066-4812 Date: 2010 Volume: 42 Issue: 3 Page: 742

Note: from 1 September 2012 I take up the post of Professor of Conservation Politics at the Durrell Institute of Conservation Ecology (DICE) in the School of Anthropology and Conservation, University of Kent.

I am Professor of International Politics, and I held posts at Edinburgh University and Lancaster University before joining Manchester in 2005. I take a deliberately interdisciplinary approach to understanding conservation; my work is located at the intersection between international relations, geography and sociology. My work examines the debates on global environmental governance, especially the roles of international NGOs, international treaties, international financial institutions and epistemic communities. I am particularly interested in how global environmental management regimes play out on the ground, how they are contested, challenged and resisted by their encounter at the local level. I focus on wildlife conservation, tourism and illicit trading networks to understand the local level complexities of global environmental management. I have undertaken a number of ESRC funded research projects on Peace Parks, gemstone mining and national parks,and on ecotourism (more details are under 'research interests'. My most recent book, Nature Crime: How We're Getting Conservation Wrong (Yale University Press, 2010) examines how global dynamics of wealth and poverty shape conservation outcomes. More information is on my personal wesbite 'Conservation Politics' <http://conservationpolitics.wordpress.com/>

However, it is critically important not to reify neoliberalism and ascribe it a greater level of coherence and dominance than it really deserves (Bakker 2005; Castree 2008a; Brenner and Theodore 2002; Mansfield 2004; McCarthy and Prudham 2004). Instead it is important to interrogate how neoliberalism plays out “on the ground”, to probe its complexities, unevenness and messiness (see Peck and Tickell 2002). In this paper we concentrate on comparing the practices of neoliberalism in order to draw out these messy entanglements; this demonstrates how neoliberalism can be challenged, resisted and changed by its encounter with nature (Bakker 2009; Castree 2008b:161). Therefore, we do not rehearse the well worn debates on definitions of neoliberalism, but rather take up the challenge of comparative research on “actually existing neoliberalisms”, which involves engaging with contextual embeddedness in order to complicate neat theoretical debates. As Brenner and Theodore (2002:356–358) suggest, to understand actually existing neoliberalism we must explore the path-dependent, contextually specific interactions between inherited regulatory landscapes and emergent forms of neoliberalism. As such, the neat lines and models generated via theoretical debates can be traced, refined, critiqued and challenged through engagement with specific case studies (Bakker 2009; Castree 2008b).

# 1AR

## 1ar value to life

#### Life outweighs value

Jonathan **Schell**, Writer-New Yorker, **’82** (The Fate of the Earth)

But the mere risk of extinction has a significance that is categorically different from, and **immeasurably greater** than, that of any other risk, and as we make our decisions we have to take that significance into account. Up to now, every risk has been contained within the frame of life; **extinction will shatter the frame**. It represents not the defeat of some purpose but an abyss in which all human purposes would be drowned for all time. We have no right to place the possibility of limitless, eternal defeat on the same footing as risks that we run in the ordinary conduct of our affairs in our particular transient moment of human history. To employ a mathematical analogy, we can say that although the risk of extinction may be fractional, the stake is, humanly speaking, infinite, and a fraction of infinity is still infinity. In other words, once we learn that a holocaust might lead to extinction, we have no right to gamble, because if we lose, the game will be over, and neither we nor anyone else will ever get another chance. Therefore, although, scientifically speaking, there is all the difference in the world between the mere possibility that a holocaust will bring about extinction and the certainty of it, morally they are the same, and we have no choice but to address the issue of nuclear weapons as though we knew for a certainty that their use would put an end to our species.

#### The impact is nonsense

Lisa **Schwartz** [et al.], Medical Ethicist, **‘2** ([www.fleshandbones.com/readingroom/pdf/399.pdf](http://www.fleshandbones.com/readingroom/pdf/399.pdf))

The first criterion that springs to mind regarding the value of life is usually the quality of the life or lives in question: The quality of life ethic puts the emphasis on the type of life being lived, not upon the fact of life. Lives are not all of one kind; some lives are of great value to the person himself and to others while others are not. What the life means to someone is what is important. Keeping this in mind it is not inappropriate to say that some lives are of greater value than others, that the condition or meaning of life does have much to do with the justification for terminating that life.1 Those who choose to reason on this basis hope that if the quality of a life can be measured then the answer to whether that life has value to the individual can be determined easily. This raises special problems, however, because the idea of quality involves a value judgment, and value judgments are, by their essence, subject to indeterminate relative factors such as preferences and dislikes. Hence, quality of life is difficult to measure and will vary according to individual tastes, preferences and aspirations. As a result, **no general rules or principles can be asserted that would simplify decisions about the value of a life based on its quality.**

## Impact D

#### The data is clear – all measures of life are improving – even in the world’s poorest countries

Gates, chairman of the Bill & Melinda Gates Foundation, 2011

(Bill, Foreword to *Getting Better* by Charles Kenny, searchable Kindle Edition)

Getting Better dispels the gloom and doom with a wealth of convincing data on the remarkable, underappreciated progress that almost all developing countries have achieved over the past several decades—many with the help of considerable aid support. At less than 2 percent of public spending in most donor countries, aid’s true impact has been obscured by a paradox. The billions of dollars that the West has poured into poor countries have had a limited impact on income, which is what most economists use to measure progress in living standards. Many countries in Africa today have real per-capita incomes lower than that of Britain at the time of the Roman Empire. Over the past several decades, through good times and bad, the income gap between rich and poor countries has grown. And no one really knows why. **But income is only one measure of success**, and maybe not the most meaningful one. We care about it mostly as a proxy for what money can buy: **food**, **shelter**, **health**, **education**, **security**, and other factors that contribute to human well-being. More so than income, these are the things that development aid directly addresses. **And by these measures**—this is Mr. Kenny’s great insight—**quality of life**, **even in the world’s poorest countries**, **has improved dramatically over the past several decades**, far more than most people realize. Fifty years ago, more than half the world’s population struggled with getting enough daily calories. By the 1990s, this figure was below 10 percent. Famine affected less than three-tenths of 1 percent of the population in sub-Saharan Africa from 1990 to 2005. As Mr. Kenny suggests, **the record has thoroughly disproved Malthusian prophecies of food shortages caused by spiraling population growth**. Family sizes have fallen for many decades now in every region, including Africa. And there’s more good news. Virtually everywhere, **infant mortality is down and life expectancy is up**. In Africa, life expectancy has increased by ten years since 1960, despite the continent’s HIV pandemic. Nearly 90 percent of the world’s children are now enrolled in primary schools, compared with less than half in 1950. Literacy rates in the sub-Saharan region have more than doubled since 1970. Political and civil rights also have gained ground.

## 2nc no extinction

#### Warming won’t cause extinction

Barrett, professor of natural resource economics – Columbia University, ‘7

(Scott, Why Cooperate? The Incentive to Supply Global Public Goods, introduction)

First, climate change does not threaten the survival of the human species.5 If unchecked, it will cause other species to become extinction (though biodiversity is being depleted now due to other reasons). It will alter critical ecosystems (though this is also happening now, and for reasons unrelated to climate change). It will reduce land area as the seas rise, and in the process displace human populations. “Catastrophic” climate change is possible, but not certain. Moreover, and unlike an asteroid collision, large changes (such as sea level rise of, say, ten meters) will likely take centuries to unfold, giving societies time to adjust. “Abrupt” climate change is also possible, and will occur more rapidly, perhaps over a decade or two. However, abrupt climate change (such as a weakening in the North Atlantic circulation), though potentially very serious, is unlikely to be ruinous. Human-induced climate change is an experiment of planetary proportions, and we cannot be sur of its consequences. Even in a worse case scenario, however, global climate change is not the equivalent of the Earth being hit by mega-asteroid. Indeed, if it were as damaging as this, and if we were sure that it would be this harmful, then our incentive to address this threat would be overwhelming. The challenge would still be more difficult than asteroid defense, but we would have done much more about it by now.

#### Experts agree

Hsu 10 (Jeremy, Live Science Staff, July 19, pg. <http://www.livescience.com/culture/can-humans-survive-extinction-doomsday-100719.html>)

His views deviate sharply from those of most experts, who don't view climate change as the end for humans. Even the worst-case scenarios discussed by the Intergovernmental Panel on Climate Change don't foresee human extinction. "The scenarios that the mainstream climate community are advancing are not end-of-humanity, catastrophic scenarios," said Roger Pielke Jr., a climate policy analyst at the University of Colorado at Boulder. Humans have the technological tools to begin tackling climate change, if not quite enough yet to solve the problem, Pielke said. He added that doom-mongering did little to encourage people to take action. "My view of politics is that the long-term, high-risk scenarios are really difficult to use to motivate short-term, incremental action," Pielke explained. "The rhetoric of fear and alarm that some people tend toward is counterproductive." Searching for solutions One technological solution to climate change already exists through carbon capture and storage, according to Wallace Broecker, a geochemist and renowned climate scientist at Columbia University's Lamont-Doherty Earth Observatory in New York City. But Broecker remained skeptical that governments or industry would commit the resources needed to slow the rise of carbon dioxide (CO2) levels, and predicted that more drastic geoengineering might become necessary to stabilize the planet. "The rise in CO2 isn't going to kill many people, and it's not going to kill humanity," Broecker said. "But it's going to change the entire wild ecology of the planet, melt a lot of ice, acidify the ocean, change the availability of water and change crop yields, so we're essentially doing an experiment whose result remains uncertain."

## 2NC No Extinction

#### Adaptation and migration solve

Ian **Thompson et al. 9**, Canadian Forest Service, Brendan Mackey, The Australian National University, The Fenner School of Environment and Society, College of Medicine, Biology and Environment, Steven McNulty, USDA Forest Service, Alex Mosseler, Canadian Forest Service, 2009, Secretariat of the Convention on Biological Diversity “Forest Resilience, Biodiversity, and Climate Change” Convention on Biological Diversity

 While resilience can be attributed to many levels of organization of biodiversity, the genetic composition of species is the most fundamental. Molecular genet- ic diversity within a species, species diversity within a forested community, and community or ecosystem diversity across a landscape and bioregion represent expressions of biological diversity at different scales. The basis of all expressions of biological diversity is the genotypic variation found in populations. The individuals that comprise populations at each level of ecological organization are subject to natural se- lection and contribute to the adaptive capacity or re- silience of tree species and forest ecosystems (Mull- er-Starck et al. 2005). Diversity at each of these levels has fostered natural (and artificial) regeneration of forest ecosystems and facilitated their adaptation to dramatic climate changes that occurred during the quaternary period (review by: DeHayes et al. 2000); this diversity must be maintained in the face of antici- pated changes from anthropogenic climate warming. Genetic diversity (e.g., additive genetic variance) within a species is important because it is the basis for the natural selection of genotypes within popu- lations and species as they respond or adapt to en- vironmental changes (Fisher 1930, Pitelka 1988, Pease et al. 1989, Burger and Lynch 1995, Burdon and Thrall, 2001, Etterson 2004, Reusch et al. 2005, Schaberg et al. 2008). The potential for evolutionary change has been demonstrated in numerous long- term programmes based on artificial selection (Fal- coner 1989), and genetic strategies for reforestation in the presence of rapid climate change must focus on maintaining species diversity and genetic diversi- ty within species (Ledig and Kitzmiller 1992). In the face of rapid environmental change, it is important to understand that the genetic diversity and adap- tive capacity of forested ecosystems depends largely on in situ genetic variation within each population of a species (Bradshaw 1991). Populations exposed to a rate of environmental change exceeding the rate at which populations can adapt, or disperse, may be doomed to extinction (Lynch and Lande 1993, Burger and Lynch 1995). Genetic diversity deter- mines the range of fundamental eco-physiological tolerances of a species. It governs inter-specific competitive interactions, which, together with dispersal mechanisms, constitute the fundamental de- terminants of potential species responses to change (Pease et al. 1989, Halpin 1997). In the past, plants have responded to dramatic changes in climate both through adaptation and migration (Davis and Shaw 2001). The capacity for long-distance migration of plants by seed dispersal is particularly important in the event of rapid environmental change. Most, and probably all, species are capable of long-distance seed disper- sal, despite morphological dispersal syndromes that would indicate morphological adaptations primarily for short-distance dispersal (Cwyner and MacDon- ald 1986, Higgins et al. 2003). Assessments of mean migration rates found no significant differences be- tween wind and animal dispersed plants (Wilkinson 1997, Higgins et al. 2003). Long-distance migration can also be strongly influenced by habitat suitabil- ity (Higgins and Richardson 1999) suggesting that rapid migration may become more frequent and vis- ible with rapid changes in habitat suitability under scenarios of rapid climate change. The discrepancy between estimated and observed migration rates during re-colonization of northern temperate forests following the retreat of glaciers can be accounted for by the underestimation of long-distance disper- sal rates and events (Brunet and von Oheimb 1998, Clark 1998, Cain et al. 1998, 2000). Nevertheless, concerns persist that potential migration and ad- aptation rates of many tree species may not be able to keep pace with projected global warming (Davis 1989, Huntley 1991, Dyer 1995, Collingham et al. 1996, Malcolm et al. 2002). However, these models refer to fundamental niches and generally ignore the ecological interactions that also govern species dis- tributions.

## Alt

**The system’s resilient and the alt fails**

Gideon **Rose 12**, Editor of Foreign Affairs, “Making Modernity Work”, Foreign Affairs, January/February

The central question of modernity has been how to reconcile capitalism and mass democracy, and since the postwar order came up with a good answer, it has managed to weather all subsequent challenges. The upheavals of the late 1960s seemed poised to disrupt it. But despite what activists at the time thought, they had little to offer in terms of politics or economics, and so their lasting impact was on social life instead. This had the ironic effect of stabilizing the system rather than overturning it, helping it live up to its full potential by bringing previously subordinated or disenfranchised groups inside the castle walls. The neoliberal revolutionaries of the 1980s also had little luck, never managing to turn the clock back all that far. **All potential alternatives** in the developing world, meanwhile, **have proved to be either dead ends or temporary detours from the beaten path**. The much-ballyhooed "rise of the rest" has involved not the discrediting of the postwar order of Western political economy but its reinforcement: the countries that have risen have done so by embracing global capitalism while keeping some of its destabilizing attributes in check, and have liberalized their polities and societies along the way (and will founder unless they continue to do so). Although the structure still stands, however, it has seen better days. Poor management of public spending and fiscal policy has resulted in unsustainable levels of debt across the advanced industrial world, even as mature economies have found it difficult to generate dynamic growth and full employment in an ever more globalized environment. Lax regulation and oversight allowed reckless and predatory financial practices to drive leading economies to the brink of collapse. Economic inequality has increased as social mobility has declined. And a loss of broad-based social solidarity on both sides of the Atlantic has eroded public support for the active remedies needed to address these and other problems. Renovating the structure will be a slow and difficult project, the cost and duration of which remain unclear, as do the contractors involved. Still, at root, **this is not an ideological issue**. The question is not what to do but how to do it--how, under twenty-first-century conditions, to rise to the challenge Laski described, making the modern political economy provide enough solid benefit to the mass of men that they see its continuation as a matter of urgency to themselves. The old and new articles that follow trace this story from the totalitarian challenge of the interwar years, through the crisis of liberalism and the emergence of the postwar order, to that order's present difficulties and future prospects. Some of our authors are distinctly gloomy, and one need only glance at a newspaper to see why. But remembering the far greater obstacles that have been overcome in the past, **optimism would seem the better long-term bet**.

**No crisis of ideology**

Gideon **Rose 12**, Editor of Foreign Affairs, “Making Modernity Work”, Foreign Affairs, January/February

We are living, so we are told, through an ideological crisis. The United States is trapped in political deadlock and dysfunction, Europe is broke and breaking, authoritarian China is on the rise. Protesters take to the streets across the advanced industrial democracies; the high and mighty meet in Davos to search for "new models" as sober commentators ponder who and what will shape the future. In historical perspective, however, **the true narrative of the era is actually the reverse--not ideological upheaval but stability**. Today's troubles are real enough, but they relate more to policies than to principles. The major battles about how to structure modern politics and economics were fought in the first half of the last century, and they ended with the emergence of the most successful system the world has ever seen. Nine decades ago, in one of the first issues of this magazine, the political scientist Harold Laski noted that with "the mass of men" having come to political power, the challenge of modern democratic government was providing enough "solid benefit" to ordinary citizens "to make its preservation a matter of urgency to themselves." A generation and a half later, with the creation of the postwar order of mutually supporting liberal democracies with mixed economies, that challenge was being met, and as a result, more people in more places have lived longer, richer, freer lives than ever before. In ideological terms, at least, all the rest is commentary.