

Science & Politics: They're Not Independent Variables

by Diana Crow

Despite the myriad of settings and audiences, virtually every speech this election year has centered on one topic: government spending. Each side has unleashed a barrage of relentlessly repetitive arguments about how their strategy will be the one to cure the economy's ills and how the opposing side's plan will sink us deeper into the slump. Yet, paradoxically, one of the most crucial areas of federal spending has barely been mentioned: scientific research.

And it's easy to see why that's been the case. To most Americans, science is a remote and abstract field, one that is vital because of its role in the development of technology, but far less immediate than job loss. Still, I find it disturbing that neither major party has said much about scientific research. The official Democratic Party Platform boldly declares, "Democrats are committed to preparing math and science teachers and training workers with skills for the future, and doubling funding for key basic research agencies" without elaborating on what research they will fund or where the money will come from. Clues about the direction of each party's scientific spending policy have been spread out across sections on environmental issues, cyber-security, and internet freedom, but neither party has explicitly laid out their plan for directing scientific research.

However, in reading through the Republican Party's official platform, it becomes clear that they want to steer publicly funded research away from topics like environmental sustainability and more toward areas that benefit the armed forces and private industry. Both sides emphasize cybersecurity and the development of competitive computer technology as a priority. However, the Romney camp argues that many of the Obama administration's policies have hindered intellectual freedom and innovation, which has slowed the rate of scientific progress.

In a statement published in *Scientific American*, Romney criticizes the President's scientific policy, saying, "President Obama's misguided attempts to play the role of venture capitalist, pick winners and losers, and spend tens of billions of dollars on politically-prioritized investments have been a disaster for the American taxpayer...As president, I will focus government resources on research programs that advance the development of knowledge, and on technologies with widespread application and potential to serve as the foundation for private sector innovation and commercialization."

While it is important to encourage research into fields that lead to useful commercial applications, there is a reason why government agencies like the National Science Foundation are key players in funding research. There are a lot of research areas that don't have immediate commercial applications, but these research areas, what we call "pure research," are the glue that holds our body of scientific knowledge together.

For example, without pure research into how different chemicals interact, we wouldn't have any idea which ones could be used for anti-cancer treatments or which ones are most potentially harmful to the environment. Pure research generates a baseline level of increasing scientific knowledge, which enables privately-funded scientists to pursue their more specific, economically-motivated questions. Additionally, pure research often pays

huge dividends down the road when further studies allow scientists to contextualize and find applications for the original results. It's hard to imagine a venture capitalist paying Einstein to develop the theory of relativity, but without it, we wouldn't have GPS. Or modern physics.

Although channelling scientific research into venues that will create jobs makes some sense, the lack of awareness about the role of publicly-funded research in the Republican platform is disturbing. The fact that they frame the Democrats' plan to continue supporting investigations into climate change and stem cell research as ideological quests rather than practical attempts to address issues that affect the public health reveals more about the Republicans than it does their opponents.

In one particularly telling passage in their chapter on environmental policy in the official Republican Party Platform, the Republican Platform Committee writes, "The most powerful environmental policy is liberty, the central organizing principle of the American Republic and its people. Liberty alone fosters scientific inquiry, technological innovation, entrepreneurship, and information exchange."

This is simply not true. While intellectual liberty is vital to sustaining productive scientific inquiry, science is expensive. Even fairly basic scientific accoutrements cost a lot of money. A set of 96 Qiagen DNA-extraction kits (which a Bard-sized bio lab would easily go through in less than a semester) costs \$1,102. Large but essential pieces of equipment like GC/mass spectrometers and MRI machines cost hundreds of thousands of dollars apiece. Science costs money, and pure research is no cheaper than any other form of research. Yes, we should encourage scientists to come up with cheaper, cost-effective solutions, but a healthy, vibrant research community cannot persist without funding.

Even though the Republican party stresses the need for research not to be directed solely by one particular interest group, they relate *everything* back to the "job creators". They dismiss the need for investigation into climate change, asserting in their platform, "The environment is getting cleaner and healthier. The nation's air and waterways as a whole, are much healthier than they were just a few decades ago. Efforts to reduce pollution, encourage recycling, educate the public, and avoid ecological degradation have been a success. To ensure their continued support by the American people, however, we need a dramatic change in the attitude of officials in Washington, a shift from a job-killing punitive mentality to a spirit of cooperation with producers, landowners, and the public...Legislation to restore the authority of States in environmental protection is essential."

This statement is absurd, partly because the handful of dimensions of water and air quality that have improved since the 1970s improved, not in spite of EPA regulations, but rather because of these regulations. Dismantling the EPA would be an ecological disaster. It does make sense for local teams to spearhead environmental sustainability efforts in their areas, but there are many regions in the country that have fewer economic and scientific resources to turn toward addressing environmental issues. And since the environment, the oceans, and the atmosphere aren't divided along state lines, *someone* needs to coordinate sustainabil-



Artwork by Michael Di Rosa

ity initiatives at the national level.

Nowhere in the extensive chapter on job creation does the Republican 2012 platform mention environmental sustainability or accountability for actions which negatively impact any other species on the planet. However, when it comes to the EPA "We likewise support pending legislation to ensure cumulative analysis of EPA regulations and to require full transparency in all EPA decisions, so that the public will know in advance their full impact on American jobs and the economy." Apparently, the full impact of factory building and job creation initiatives on the rest of the biosphere is not something which we should take into consideration, but the Environmental Protection Agency should be more concerned with the effect of its policies on job creation than with the organisms and resources it is charged with protecting.

Even though the Democrats are far more supportive of investigations into environmental and sustainability issues, they, too, talk about environmental health initiatives solely in terms of their benefit to humans. Their party platform counters the Republican position by saying, "Our opponents have moved so far to the right as to doubt the science of climate change, advocate the selling of our federal lands, and threaten to roll back environmental protections that safeguard public health. Their leaders deny the benefits of the Clean Air and Clean Water Acts—benefits like job creation, health, and the prevention of tens of thousands of premature deaths each year. They ignore the jobs that are created by promoting outdoor recreation, cleaning up our air, and promoting a healthy environment."

This is a far more realistic and productive approach to dealing with environmental issues, but as someone who's spent most of her adult life studying non-human organisms, it's incredibly frustrating to see that both of my country's major parties seem to value this planet's other life forms and ecosystems only in terms

of human health and human economic values.

Despite the fact that the Democratic platform lists cybersecurity, biological weapons, and climate change as three of the four biggest emerging threats to our country, they spend very little time talking about their policy in other scientific fields. This would be alright if political influence over science were limited to the issues that have become issues of contention between partisan factions. But politics doesn't just affect stem cells, cyber-security, and climate change; it also affects cancer research, materials science, neuroscience, disease ecology, applied physics, and every other scientific field that relies on federal funding.

However, issues that affect the scientific community have received practically no airtime in the public speeches or debates. This is partly due to the perception that average voters either don't care about or don't understand science and partly due to the fact that many of the details about distribution of scientific funding are in the hands of scientific advisory panels built into organizations like the NSF. But politicians are the ones who determine how much money those organizations have to work with and are the ones who establish mandates about which research areas should receive the most funding.

Political power over scientific research is not a scalpel but rather a blunt instrument. It's not an absolute power, but the party that controls the budget will have an effect on how much basic research we can do in the next four years. I'm not saying that scientific issues should be allowed to overshadow other important issues that are at stake in this election, but I think, that as voters in an industrialized, digitalized information nation on a planet that's facing a potential mass extinction due to pollution, global warming, and habitat fragmentation, we have to consider what effects our political elections have on the economy of science and the development of scientific knowledge.