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Subject: November 7 update
Date: Wed, 07 Nov 2012 20:51:32 +0000

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Article 1.

NYT

Hope and Change: Part Two

[Thomas L. Friedman](#)

November 7, 2012 -- In October 2010, Senator Mitch McConnell, the Republican leader, famously told The National Journal, "The single most

important thing we want to achieve is for President Obama to be a one-term president.” And that’s how he and his party acted.

Well, Mitch, how’s that workin’ out for ya?

No one can know for sure what complex emotional chemistry tipped this election Obama’s way, but here’s my guess: In the end, it came down to a majority of Americans believing that whatever his faults, Obama was trying his hardest to fix what ails the country and that he had to do it with a Republican Party that, in its gut, did not want to meet him halfway but wanted him to fail — so that it could swoop in and pick up the pieces. To this day, I find McConnell’s declaration appalling. Consider all the problems we have faced in this country over the last four years — from debt to adapting to globalization to unemployment to the challenges of climate change to terrorism — and then roll over that statement: “The single most important thing we want to achieve is for President Obama to be a one-term president.”

That, in my view, is what made the difference. The ██████ lost an election that, given the state of the economy, it should have won because of an excess of McConnell-like cynicism, a shortage of new ideas and an abundance of really bad ideas — about immigration, about climate, about how jobs are created and about abortion and other social issues.

It seems that many Americans went to the polls without much enthusiasm for either candidate, but, nevertheless, with a clear idea of whom they preferred. The majority seemed to be saying to Obama: “You didn’t get it all right the first time, but we’re going to give you a second chance.” In a way, they voted for “hope and change” again. I don’t think it was so much a ratification of health care or “Race to the Top” or any other Obama initiative. It was more a vote on his character: “We think you’re trying. Now try even harder. Learn from your mistakes. Reach out to the other side, even if they slap away your hand, and focus like a laser on the economy, so those of us who voted for you today without much enthusiasm can feel good about this vote.”

And that is why Obama’s victory is so devastating for the ██████. A country with nearly 8 percent unemployment preferred to give the president a second chance rather than Mitt Romney a first one. The Republican Party today needs to have a real heart-to-heart with itself.

The [REDACTED] has lost two presidential elections in a row because it forced its candidate to run so far to the loony right to get through the primaries, dominated by its ultraconservative base, that he could not get close enough back to the center to carry the national election. It is not enough for Republicans to tell their Democratic colleagues in private — as some do — “I wish I could help you, but our base is crazy.” They need to have their own reformation. The center-right has got to have it out with the far-right, or it is going to be a minority party for a long time.

Many in the next generation of America know climate change is real, and they want to see something done to mitigate it. Many in the next generation of America will be of Hispanic origin and insist on humane immigration reform that gives a practical legal pathway to citizenship for illegal immigrants. The next generation is going to need immigration of high-I.Q. risk-takers from India, China and Latin America if the U.S. is going to remain at the cutting edge of the Information Technology revolution and be able to afford the government we want. Many in the next generation of America see gays and lesbians in their families, workplaces and Army barracks, and they don't want to deny them the marriage rights held by others. The [REDACTED] today is at war with too many in the next generation of America on all of these issues.

All that said, my prediction is that the biggest domestic issue in the next four years will be how we respond to changes in technology, globalization and markets that have, in a very short space of time, made the decent-wage, middle-skilled job — the backbone of the middle class — increasingly obsolete. The only decent-wage jobs will be high-skilled ones. The answer to that challenge will require a new level of political imagination — a combination of educational reforms and unprecedented collaboration between business, schools, universities and government to change how workers are trained and empowered to keep learning. It will require tax reforms and immigration reforms. America today desperately needs a center-right [REDACTED] that is offering merit-based, market-based approaches to all these issues — and a willingness to meet the other side halfway. The country is starved for practical, bipartisan cooperation, and it will reward politicians who deliver it and punish those who don't. The votes have been counted. President Obama now needs to get to work to justify the second chance the country has given him, and the

Republicans need to get to work understanding why that happened.

Article 2.

Foreign Policy

12 Catastrophes the Next President Must Avoid

[David Rothkopf](#)

November 5, 2012 -- Recently, Evan Thomas reminded us of one of the best examples of such leadership in Ike's Bluff, his excellent new biography of Dwight Eisenhower. Eisenhower, demeaned by John F. Kennedy as a dull paper-pusher of a president, masterfully resisted the pressure from within his own party to dangerously confront the Soviets. He avoided a cataclysmic war by overseeing a process that allowed Washington leaders to come to understand that there was a better path by which we could contain the Soviets, through strength combined with forbearance, and allow the weakness of their system to undermine them over time.

Other presidents have similarly succeeded by avoidance. George H.W. Bush, to cite another example, deserves great credit for ensuring that when the Soviet empire did fall, as Eisenhower had much earlier worked to make happen, the transitions in Eastern Europe were peaceful. Where there could have been chaos Bush reached out to other world leaders and produced an orderly handover of power. He also waged a war against Iraq after its invasion of Kuwait in which he made the wise decision not to continue on to Baghdad, avoiding a messy conflagration like that which would later consume his son's presidency.

Both Eisenhower and Bush paid a price for their successes. Eisenhower's image was for decades shaped by the Kennedy caricature of him, and it is only now that he is rightfully gaining recognition as being among the best

presidents of the last century. Bush did not win a second term as president in part because his accomplishments were too subtle to resonate with the public during the 1992 campaign.

We get a distorted view of real leadership when we discount sometimes hard to see accomplishments that come from presidents with vision, restraint, and a knack for behind-the-scenes deftness. This struck me again last week when President Obama and New Jersey Gov. Chris Christie toured the devastation wrought by Hurricane Sandy. They were hailed as leaders for their very public reaction to a crisis when in fact, real leadership would have involved avoiding the crisis in the first place -- or reducing its consequences, as we might have done had Obama, Christie, and other officials taken warnings about the consequences of climate change, severe weather, and deteriorating infrastructure more seriously. Indeed, just exercising enough prudence to take the measures that many urban planners around the world already do in areas threatened by such severe storms (regardless of their views about why such storms are now occurring with greater regularity) would have made the consequences of Sandy less grievous.

With Sandy fresh in our minds and Americans headed to the polls, it is worth looking ahead to consider what other avoidable catastrophes might be better measures of the next administration than stories the evening news can more easily point a camera at each night. Here are a dozen:

1. War with Iran—and a Nuclear Arms Race in the Middle East

The easiest war to avoid may be the one everyone sees coming. But in the case of conflict with Iran, it will not be so simple. In the first instance, to stop Iranian weapons development will require a more credible threat of military action from powers capable of derailing the program than currently exists. Next, while there are sensible arguments that suggest Iran's acquisition of nuclear weapons is not only unavoidable but may not be disastrous given our deterrent capacity, the bigger risk is not from Iran but from a world in which Iran's rivals across the Persian Gulf, such as Saudi Arabia, to others in the region and emerging powers elsewhere around the world enter a nuclear arms race. Such a race would both geometrically increase the likelihood such weapons might be used but it would also sap precious resources from struggling economies that would better spend them elsewhere. It will take toughness with Iran and a

recommitment to a new, more effective global nonproliferation regime as a top priority to avoid all those traps.

2. Regional Conflagration in the Middle East

The Greater Middle East has not been more dangerous since the darkest days of the Cold War. Today instability from Tunisia to Pakistan means there's a real possibility of crises spreading rapidly -- and connecting up with each other. Syria, already now a proxy conflict between Iran on the one side and various Gulf states on the other, is one such example. But imagine the consequences of a collapsing regime in Jordan or, even more likely, of what the coming reckoning in a fractured Iraq will look like. The next U.S. administration will be tempted to lean back and indeed, must embrace solutions led by regional actors more than ever before. But as with Iran, it will take vastly more effective use of formal and informal global mechanisms to keep a lid on this region.

3. Escalating U.S. Involvement in an Unraveling Africa

Africa is the new Middle East. It is rich with resources, unstable, and targeted by insurgents, extremists, and major powers for both these reasons. Civil wars, corruption, historic instability, Islamic extremists, humanitarian crises, more active U.S. and European military presences, and rising stakes for China and other emerging powers have created a volatile situation that could gradually escalate into the world's newest quagmire. Will the next U.S. president be sucked into the trap of incremental escalation like the that led to the Vietnam War?

4. The Next 9/11

Among those who have done the most with the least credit are those up and down the U.S. chain of command who have forestalled terror attacks. Since 9/11, the record of protecting the homeland and Americans around the world has been admirable. But the next president will have to do that, and then some: by avoiding another 9/11, I mean something more than confounding the plots of terrorists. I mean avoiding events that suck America into the orgy of political hysteria, government spending, and violating our own most cherished principles that marked our "war on terror." It is not enough simply to neutralize terrorists. We need to ensure that we regain the perspective that allows us to respond to threats proportionally and in ways that do not damage our standing in the world or

ability to lead. (Note: Waves of drone attacks, cyber incursions, and special ops only meet the first half of this guideline.)

5. A Trade War with China

With sluggish economies in the United States and China and both countries engaging in artificial devaluation of their currencies, it's easy to imagine scenarios that lead to conflict as blame-shifting escalates and populist impulses rule. That's especially the case given that China through subsidies and other unfair practices has yet to start playing by the international trade rules it accepted over a decade ago. But confrontation could easily get out of hand, threaten China's new leadership, and deteriorate into a real trade war. Not only is this economically unhealthy for the world's two largest (and very interdependent) economies but it would be diplomatically devastating since many of the biggest problems require a kind of cooperation between the two sides we have seldom seen before.

6. A U.S. Fiscal Catastrophe

The "fiscal cliff" is only the first among many huge challenges associated with getting America's financial house in order. Failing to address these could further undercut America's credit rating, our ability to invest in our future or protect ourselves, and even lead to default. Neither the world economy nor our own can withstand more of the kind of brinksmanship and denial practiced by Washington in the past decade. Tax increases and spending cuts in programs beloved by both political parties in America are absolutely essential to beginning a trajectory of improvement in this critical area.

7. A Japan-Style American Stagnation

Austerity alone will not, however, do the trick. America is at a moment of huge opportunity. Of the world's developed economies, we are the one showing the most resilience. We are home to a potential bonanza associated with new energy resources and we can borrow to invest in much needed infrastructure upgrades at very low cost (provided we do so wisely). We can make our educational system more effective at training the workers of tomorrow. But this requires more than just speeches and modest gestures. We must make growth a priority and yet do so in ways—such as removing regulatory obstacles, shifting from defense spending to investment spending at home, embracing foreign investment—that avoids

the kind of multi-decade downturn that has straightjacketed Japan since the 1990s.

8. Economic Shocks from the Eurozone

While Europe made some progress in recent months toward calming market unease, austerity measures are likely to produce political pushback of a potentially extreme nature in the next couple of years. What's more, global shocks from other international crises, whether a war in Iran or an escalating Middle East conflict, could make the bad situation in Europe worse and compound any geopolitical misfortune with nasty economic consequences. Such political reversals could also renew discussion of breaking up the European Union (which may or may not be a bad thing) and make markets very skittish again (which would be). The United States will have to find a way to remain actively engaged but this may become even more challenging as some of the promising "fixes" of 2012 turn into the setbacks of 2013 and beyond.

9. Shocks From a Warming Climate

It may be too late. We may not be able to reverse the changes to our environment that are making severe storms more common, melting our ice caps, and producing record high temperatures. If that's true, then we face a choice: reactive or proactive adaptation. Right now, we merely react, responding to disasters. But we could strengthen our sea walls, improve our electricity grids, rebuild ports and bridges and roadways. Of course, this should not supplant efforts to rein in carbon emissions-and we should embrace the fact that shifting from coal to gas power will help spur the American domestic energy revolution and create jobs and growth at home. But the bigger point is that great leaders will be measured by how few tragic photo ops their successors feel obligated to stage in the wake of crises.

10. The Next Financial Market Crisis

Here's the bad news: Global markets are rife with more risks today than they were in 2008. There are more too-big-to-fail banks. There are larger and more complex and opaque oceans of derivatives churning. There is still no global regulation. There are still major markets containing big bubbles from Chinese real estate to the price of gold worldwide. In short, there is still the potential for such a massive meltdown that it could make the crisis that ushered in the Obama era look like mere prelude. It is time to get

much more serious about U.S. and international oversight and enforcement, investing in the tools and people needed to identify and avoid future upsets.

11. 1960s-Style Social Unrest

It seems a long shot. And indeed, social crisis from the Middle East to China to an increasingly nationalistic and xenophobic Europe is more likely. But American leaders must focus on what they can control. And if inequality continues to grow in the United States; if our underclass, with its skyrocketing high school dropout rates, continues to fall faster and faster behind; if fiscal austerity forces us to shrink social programs and shrinking tax bases crush the ability of cities to tackle their problems (or pay their pensions), America may see unrest evoking that of the 1960s...or worse. We run a great risk if we view what is happening in this country merely as a cyclical slowdown. Any society that pushes the rich and poor farther and farther apart is broken. And we need to address the problem just as we did the racial divides that haunted us in the '60s-as a matter of grave national urgency.

12. An Era of Permanent War

Cyberwar is often called "white collar conflict." This is both a blessing and a curse. It is stealthy and may cause less loss of life than traditional armed conflicts. But this makes it more tempting to engage in. And a world in which nations constantly probe and injure one another from afar could turn out to be vastly more dangerous in the long run. Cyberattacks will produce damage that demands retribution. Trust and stability will be undermined. And societies will reel not just from attacks that target infrastructure or markets but also from the civil liberties likely to be constrained in an effort to reduce the likelihood of future intrusions. The next American administration needs to be careful that it does not see such attacks-or the other "limited footprint" tools of war, from drones to special operations-as so "low risk" that it over-utilizes them. Otherwise, we'll be creating more risks than we alleviate.

Article 3.

Foreign Policy

8 Ways the World Has Changed Since Obama's Election

Ty McCormick, [Uri Friedman](#)

November 6, 2012 -- During the 2012 presidential election, Republicans assailed President Barack Obama's economic record by invoking Ronald Reagan's famous question: Are you better off than you were four years ago?

What if we asked the same question about the world? Four years is a long time, and you might be surprised by just how much has changed since Obama was elected in 2008. Here's a look at eight of the most important and interesting trends.

Tech Revolution

Yes, the world had iPhones four years ago and Facebook, Twitter, and Reddit were all part of the webscape, but the face of technology has changed dramatically since the last election -- most notably by reaching roughly a billion more people. Since November 2008, the number of Internet users worldwide has soared from roughly 1.5 to roughly 2.5 billion -- a 40 percent increase. At the same time, the number of Facebook users increased tenfold from 100 million to more than 1 billion and the average number of Tweets per day increased from around 300,000 to 340 million. (During the hour-and-a-half-long presidential debate in Denver, Twitter fanatics posted more than 10 million times.)

Just how much the speed of technological change has affected world politics still a matter for debate, but it seems clear that Twitter and Facebook played at least some role in the uprisings that spread across the Arab world in 2011. The Occupy movement, too, made use of social media and, perhaps more creatively, harnessed the power of drones -- now sold privately for as little as \$300 -- to monitor police brutality. (Watch this [video](#) from Occupy Warsaw.) Other technological advances that were perhaps unimaginable back in 2008 include [private space travel](#), [radar that can see through walls](#), and [mosquito lasers](#).

Economic Malaise

At this time four years ago, Lehman Brothers had only recently [collapsed](#), Japan still had a [larger economy](#) than China, and European leaders [had yet](#)

[to hold](#) their first debt crisis summit. Unfortunately, this period of great change has not brought much relief to a sluggish global economy. The [International Labor Organization](#) estimates that the global unemployment rate has risen from 5.6 percent in 2008 to a projected 6 percent in 2012 (with more than 200 million people currently out of work around the world out of 3.3 billion workers), and [reports](#) that the 2011 global employment rate of 60.3 percent is 0.9 percentage points lower than before the recession -- translating into 50 million "missing" jobs in the world economy. As youth and long-term unemployment rise, poverty rates and inequality have also increased in half of the world's advanced economies and one-third of the world's developing economies, heightening the risk of social unrest everywhere from Europe to North Africa. [World gross product](#) has recovered after falling 2.4 percent in 2009, but growth is decelerating, raising the specter of another economic downturn afflicting developed and developing countries alike.

The United States is still the [largest economy](#) in the world, but over the course of Obama's term China [has overtaken](#) Japan as the world's second-largest economy and Brazil [has surpassed](#) Britain as the world's sixth-largest. Meanwhile, the United States has fallen from first place in the World Economic Forum's [2008-2009 Global Competitiveness Index](#) to seventh place in the organization's [2012-2013 ranking](#) (Switzerland now tops the list). The [report](#) praised the country's innovative corporate sector, first-class university system, and flexible labor markets but raised alarm bells about its partisan gridlock and wasteful spending. "A lack of macroeconomic stability continues to be the country's greatest area of weakness," the study concluded.

Arctic Sea Melt

Four years is too short of an interval to meaningfully capture the extent of climate change, but one area that stands out for its rapid deterioration is Arctic sea melt. Every summer, part of the Arctic Ocean melts away and historically, about [half](#) of it is gone by September. Since scientists began monitoring ice melt in the 1970s, however, melting has accelerated substantially so that ice now covers only about a quarter of the Arctic Ocean at its lowest point. Even in the last four years, the [low point](#) -- the day when melting stops and the sea begins to gradually freeze over again -- has dropped appreciably, from 1.61 million square miles of ice coverage

(29 percent of the Arctic Ocean) in 2008 to 1.32 million square miles (24 percent of the Arctic Ocean) in 2012.

The [average ice extent](#) for the month of September, a standard measure for the study of Arctic sea ice, tells a similar story. In 2008, it stood at 1.80 million square miles, whereas this year it clocked in at [1.39 million square miles](#) -- 48.7 percent below average and the lowest level in the satellite era. Arctic ice is disappearing so quickly that Peter Wadhams, a Cambridge University professor who has been collecting data on ice thickness from submarines for many years, [predicts](#) that the ice will melt completely by 2015 or 2016.

Global Health Advances

Because of the significant time lag for most data on global health trends, it's difficult to paint a comprehensive picture of how the fight against disease has fared over the last four years. Even so, it's clear that there have been some significant victories: India, which in 2009 had the highest incidence of polio in the world, has been [removed](#) from the World Health Organization's polio-endemic list, leaving Nigeria, Pakistan, and Afghanistan as the lone holdouts in the fight against the crippling childhood disease.

Meanwhile, the last four years has seen a 132 percent [increase](#) in the number of people with access to preventative malaria measures and the preliminary results have been positive. Between 2008 and 2010, the last year for which the World Health Organization has data, the number of annual malaria deaths dropped from nearly [863,000](#) to [655,000](#) -- and this while the world's [population](#) increased by almost 200 million. At the same time, researchers have made substantial progress toward a malaria vaccine -- which [reduced](#) the incidence of the tropical disease by 50 percent in a 2011 clinical trial in Africa -- though there is growing concern about the spread of drug-[resistant](#) strains of malaria, especially in Southeast Asia. Programs like the President's Emergency Plan for AIDS Relief and the Global Fund to Fight AIDS, Tuberculosis, and Malaria have also made [substantial gains](#) in the fight against HIV/AIDS -- so much so that New York Times columnist Nicholas Kristof recently [wrote](#) about the plight of out-of-work coffin makers in Lesotho. There are still roughly 2.7 million new infections annually around the world, but according to the [2011 UNAIDS report](#), both infections and deaths are on the wane.

Dictator Demographics

The jury is still out on the so-called Arab Spring, but the last four years have been an unmitigated disaster for some of the world's worst and longest-serving rulers (known at FP as the committee to destroy the world). Not only did angry publics force out aging strongmen in Tunisia, Egypt, Yemen, and Libya -- who had ruled for a combined 116 years -- but a surprising number of dictators from all over the world have kicked the bucket since Obama was elected. In December 2008, Lansana Conté died in office, ending an illustrious 24-year stint as president of Guinea, during which the West African country was consistently rated among the most corrupt on the planet. A year later, the world bid farewell to the notoriously self-obsessed Omar Bongo, who had spent the previous 41 years running oil-rich Gabon as his personal estate. In the last year, North Korean enigma Kim Jong Il and Ethiopian strongman Meles Zenawi both died unexpectedly. The two had 38 years of leadership experience between them.

More Refugees, Fewer Migrants

The past four years have produced two storylines when it comes to migration patterns. First, the Arab Spring has produced major outflows of migrants and refugees from countries such as Libya and Syria. According to the [United Nations](#), 335,000 Syrian refugees have registered with the international body and 700,000 Syrians could flee the violence in their country by the end of 2012, while more than 1 million people have displaced inside Syria. As was the case with [Libya](#), most Syrians are [seeking refuge](#) in neighboring countries rather than in Europe -- in Syria's case, mainly Iraq, Jordan, Lebanon, and Turkey. We know that the number of refugees worldwide [increased](#) from 15.2 million people in 2008 to 16 million in 2010, but there's no data yet on just what kind of impact the uprisings in the Middle East have had on overall refugee trends.

More broadly, the global economic recession has slowed migration to the world's wealthiest countries. The Organization for [Economic Cooperation and Development](#) notes that the number of labor migrants to [OECD countries](#) dropped from 880,000 in 2007 to 780,000 in 2010, though preliminary 2011 figures suggest that migration to most European OECD members has since increased. This spring, the [Pew Hispanic Center](#) reported that after four decades of heavy Mexican migration to the United

States, the "net migration flow" of Mexicans to the United States had stopped and possibly even reversed. A [more recent report](#) suggests Mexican migration to the United States may be increasing again, but the recession-induced dropoff is still remarkable.

Democracy Setbacks

The Arab uprisings may have rid the world of some of its least savory leaders, but over the last four years the world has actually become less democratic. According to the Economist Intelligence Unit (EIU), which analyzes global democracy trends, the number of "full democracies" in the world declined by 16.7 percent between 2008 and 2011, the last year for which data is available. At the same time, the number of "flawed democracies" and "authoritarian regimes" increased by 5.7 and 3.8 percent respectively, while "hybrid regimes" remained constant. Freedom House, which also conducts research on governance trends, [reports](#) that 2011 "marks the sixth consecutive year in which countries with [democratic] declines outnumbered those with improvements."

Most of the damage is due to democratic backsliding in the Middle East, Africa, and Eastern Europe, though even the United States took a hit. Between 2008 and 2011, the United States slipped from 18th to 19th on EIU's Democracy Index, with a noticeable drop in its "functioning of government" score, one of the five metrics on which countries are rated.

Progress On Peace

Measuring world peace is, as the Economist has [pointed out](#), akin to describing "how happiness smells." Nonetheless, the Australia-based Institute for Economics and Peace publishes an annual Global Peace Index that rates the peacefulness of countries on a variety of indicators, including internal and external conflict, military spending, and respect for human rights. Their findings suggest that the world is ever so slightly more peaceful today than it was in 2008. The average score (based on a 1-5 scale, 1 being the most peaceful) for nations [surveyed in 2012](#) was 2.011, whereas the [average score in 2008](#) was 2.043. Steve Killelea, the survey's founder, told Reuters that the decline was due reduced military spending -- in part, because of the global financial crisis -- as well as declining violence in Africa. "The improvement in relation with the states and a greater reluctance to resort to war is very profound, particularly in Africa," he said.

The Global Peace Index findings, however limited, fit into a [larger pattern](#) identified by scholars like Steven Pinker that suggests violence has declined appreciably throughout history and especially during the 20th century. For most of human history, Pinker argues, life was indeed "nasty, brutish, and short" and if "the death rate in tribal warfare had prevailed during the 20th century ... there would have been 2 billion deaths from wars and homicide, rather than 100 million." It's a compelling argument as we contemplate the [world full of global threats](#) that will greet the next U.S. president.

Ty McCormick and Uri Friedman are editors at Foreign Policy.

Article 4.

Stratfor

The Elections, Gridlock and Foreign Policy

George Friedman

November 7, 2012 -- The United States held elections last night, and nothing changed. Barack Obama remains president. The Democrats remain in control of the Senate with a non-filibuster-proof majority. The Republicans remain in control of the House of Representatives. The national political dynamic has resulted in an extended immobilization of the government. With the House -- a body where party discipline is the norm -- under Republican control, passing legislation will be difficult and require compromise. Since the Senate is in Democratic hands, the probability of it overriding any unilateral administrative actions is small. Nevertheless, Obama does not have enough congressional support for dramatic new initiatives, and getting appointments through the Senate that Republicans oppose will be difficult. There is a quote often attributed to Thomas Jefferson: "That government is best which governs the least because its people discipline themselves." I am not sure that the current political climate is what was meant by the people disciplining themselves, but it is clear that the people have imposed profound limits on this government. Its ability to continue what is already being done has not been curbed, but its ability to do much that is new has been blocked.

The Plan for American Power

The gridlock sets the stage for a [shift in foreign policy that has been under way since the U.S.-led intervention in Libya in 2011](#). I have argued that presidents do not make strategies but that [those strategies are imposed on them by reality](#). Nevertheless, it is always helpful that the subjective wishes of a president and necessity coincide, even if the intent is not the same. In previous articles and books, I have made the case that the United States emerged as the only global power in 1991, when the Soviet Union fell. It emerged unprepared for its role and uncertain about how to execute it. The exercise of power requires skill and experience, and the United States had no plan for how to operate in a world where it was not faced with a rival. It had global interests but no global strategy. This period began in 1991 and is now in the process of ending. The first phase consisted of a happy but illusory period in which it was believed that there were no serious threats to the United States. This was replaced on 9/11 with a phase of urgent reaction, followed by the belief that the only interest the United States had was prosecuting a war against radical Islamists.

Both phases were part of a process of fantasy. American power, simply by its existence, was a threat and challenge to others, and the world remained filled with danger. On the other hand, focusing on one thing obsessively to the exclusion of all other matters was equally dangerous. [American foreign policy was disproportionate](#), and understandably so. No one was prepared for the power of the United States. During the last half of the past decade, the inability to end the wars in Iraq and Afghanistan, coupled with economic problems, convinced reasonable people that the United States had entered an age of permanent decline. The sort of power the United States has does not dissipate that fast. The [disintegration of European unity](#) and the financial crisis facing China have left the United States, not surprisingly, still the unchallenged global power. The issue is what to do with that power. The defeated challenger in the U.S. election, Mitt Romney, had a memorable and important turn of phrase when he said that you can't kill your way out of the problems of the Middle East. The point that neither Romney nor Obama articulated is what you do instead in the Middle East -- and elsewhere. Constant use of military force is not an option. See the example of the British Empire: Military force was used judiciously, but the preferred course was avoiding war in favor of political

arrangements or supporting enemies of enemies politically, economically and with military aid. That was followed by advisers and trainers -- officers for native troops. As a last resort, when the balance could not hold and the issue was of sufficient interest, the British would insert overwhelming force to defeat an enemy. Until, as all empires do, they became exhausted. The American strategy of the past years of inserting insufficient force to defeat an enemy that could be managed by other means, and whose ability to harm the United States was limited, would not have been the policy of the British Empire. Nor is it a sustainable policy for the United States. When war comes, it must be conducted with overwhelming force that can defeat the enemy conclusively. And war therefore must be rare because overwhelming force is hard to come by and enemies are not always easy to beat. The constant warfare that has characterized the beginning of this century is strategically unsustainable.

Libya and Syria

In my view, the last gasp of this strategy was Libya. The intervention there was poorly thought out: [The consequences of the fall of Moammar Gadhafi were not planned for](#), and it was never clear why the future of Libya mattered to the United States. The situation in Libya was out of control long before the [Sept. 11 attack in Benghazi](#). It was a case of insufficient force being applied to an uncertain enemy in a war that did not rise to the level of urgency. The U.S. treatment of Syria is very different. The United States' unwillingness to involve itself directly with main military force, in spite of urgings from various directions, is an instance in which even a potentially important strategic goal -- undermining Iranian influence in Syria -- could be achieved by depending on regional powers to manage the problem or to live with it as they choose. Having provided what limited aid was required to destabilize the Syrian government, the United States was content to let the local balance of power take its course. It is not clear whether Obama saw the doctrine I am discussing -- he certainly didn't see it in Libya, and his Syrian policy might simply have been a reaction to his miscalculations in Libya. But the subjective intentions of a leader are not as important as the realities he is responding to, however thoughtfully or thoughtlessly. It was clear that the United States could not continue to intervene with insufficient forces to achieve unclear goals in countries it could not subdue. Nor could the United States withdraw from the world. [It](#)

[produces almost one-quarter of the world's GDP](#); how could it? The historical answer was not a constant tempo of intervention but a continual threat of intervention, rarely fulfilled, coupled with skillful management of the balance of power in a region. Even better, when available as a course, is to avoid even the threat of intervention or any pretense of management and let most problems be solved by the people affected by it. This is not so much a policy as a reality. The United States cannot be the global policeman or the global social worker. The United States is responsible for pursuing its own interests at the lowest possible cost. If withdrawal is impossible, avoiding conflicts that do not involve fundamental American interests is a necessity since garrison states -- nations constantly in a state of war -- have trouble holding on to power. Knowing when to go to war is an art, the heart of which is knowing when not to go to war.

One of the hardest things for a young empire to master is the principle that, for the most part, there is nothing to be done. That is the phase in which the United States finds itself at the moment. It is coming to terms not so much with the limits of power as the nature of power. Great power derives from the understanding of the difference between those things that matter and those that don't, and a ruthless indifference to those that don't. It is a hard thing to learn, but history is teaching it to the United States.

The Domestic Impasse

The gridlock which this election has given the U.S. government is a suitable frame for this lesson. While Obama might want to launch major initiatives in domestic policy, he can't. At the same time, he seems not to have the appetite for foreign adventures. It is not clear whether this is simply a response to miscalculation or a genuine strategic understanding, but in either case, [adopting a more cautious foreign policy will come naturally to him](#). This will create a framework that begins to institutionalize two lessons: First, it is rarely necessary to go to war, and second, when you do go to war, go with everything you have. Obama will follow the first lesson, and there is time for the second to be learned by others. He will practice the studied indifference that most foreign problems pose to the United States. There will be a great deal of unhappiness with the second Obama administration overseas. As much as the world condemns the United States when it does something, at least part of the world is usually demanding some action. Obama will disappoint, but it is

not Obama. Just as the elections will paralyze him domestically, reality will limit his foreign policy. Immobilism is something the founders would have been comfortable with, both in domestic politics and in foreign policy. The voters have given the republic a government that will give them both.

Article 5.

AL-MONITOR

Erdogan's Bigger Game: Change the Constitution

[Tulin Daloglu](#)

Nov 5, 2012 -- Turkish Prime Minister [Recep Tayyip Erdogan](#), at the celebration of the 10-year anniversary of the ruling [Justice and Development Party](#) (AKP) on Nov. 3, reflected on the AKP's rise: "Not only a new party came to power, but a revolution in mentality took place." Erdogan is contemplating another major change in Turkish politics: rewriting the constitution so that the country's parliamentary system becomes a presidential one. If he succeeds, he would have the opportunity to continue as president with even more power until at least 2023, Turkey's centennial.

The constitutional-reform process is supposed to be an inclusive and consensual one. Erdogan has assigned the Constitution Reconciliation Committee (CRC), organized last year with three deputies from each of the elected parliamentary parties (AKP, CHP, MHP and BDP), to complete its work.

The opposition parties agreed to participate in the CRC in the first place because they also believe, in principle, that the country needs a new constitution. In fact, Turkey's lawmakers have revised the constitution

several times in the past. But the opposition is not necessarily convinced that a presidential system is what is needed.

Erdogan, however, said that he is "losing hope" that they will reach a consensus in finalizing the new constitution. "Frankly, my hope is diminishing by each passing day," the prime minister said. "Despite that, I believe we need to remain determined and passionate to conclude this process." If there is no consensus, he will put his party's proposal to a referendum.

The prime minister's initiative would have implications for both the Kurdish issue and the role of religion in public life. The proposed changes would favor AKP policies in both areas and assuring the party's continued political dominance. The ruling party is also remapping the districts and doubling — at least — the number of big city municipalities to guarantee the votes of its constituency. They argue that this won't turn Turkey into a federal system, but it will lead to "advanced local administrations." Some even speculate that this would position the AKP to take over the Diyarbakir municipality from the BDP, the Kurdish party.

Cemil Cicek, the spokesman of parliament and one of the deputy chairmen of the AKP, warns of the challenge, in his mind, of the direct election of both the president and the prime minister. "This system is prone to conflict," he said. "When the people start voting for their president, this tension between the prime minister and the president will grow."

Rather than focusing on a shift to a presidential system, the AKP could help Turkish democracy take a gigantic step by simply trusting the people. Erdogan often takes pride that he won "one out of every two votes." If he really is that confident, he needs to make one change into law. He needs to bring down the 10% threshold for parties in the popular vote to be represented in the Turkish parliament, and a minimum vote of 7% in the national election to be eligible for funds from the state treasury. That stipulation was a blatant move to keep Kurds out of Turkey's parliamentary politics.

Atilla Kart, a CHP deputy and a member of the CRC, told Al-Monitor that the "CHP has been proposing to lower that threshold to 4% since 2005," but it is the AKP government that does not agree to it. And as long as people do not really get a fair representation in the parliament, Turkey won't be able to solve its issues.

The issue may not be that the constitution needs change, but rather the election law, which was put into effect by the 1982 military constitution. Otherwise, Turkey will be pushed into more chaos and trouble because of the failure of its own parliament.

There are troubling signs on the religious issue as well. Erdogan is seen as continuing to promote a more religious and sectarian posture. For example, he has advocated a "religious youth" initiative, which led to a new law to change the education system, dubbed "4+4+4." Students now start taking selective courses at the primary school, including learning to read the Quran. Many pro-secular parents are complaining about the eligibility of the teachers as well as the content of the course material.

Freedom of the media, one of the acknowledged pillars of democracy, has also suffered under Erdogan's government. According to the international media watchdog Committee to Protect Journalists (CPJ), Turkey is the world's leading [jailer of journalists](#), with 76 in prison. The AKP government reacted strongly to the CPJ's recent report and claimed that it distorts reality for political motivations.

While Erdogan talks about a "revolution in mentality," the unfortunate events of Oct. 29 in Ankara, when police [sprayed tear gas](#) and used fire hoses on people who gathered to celebrate the country's 89th birthday, exemplifies his intolerance of the pro-secular crowds. "I did not give the order to police to bring down those barricades. They showed weakness," he said.

[Turkish President Abdullah Gul](#), Erdogan's longtime AKP ally, was more conciliatory. It became clear that the president asked the authorities to let the pro-secular Turks celebrate their country's birthday as they wish. And for them to be contradicting each other over a sensitive issue like this was significant.

Politicians who follow Islamist ideology hardly let the public know of their differences of opinion. The Ankara beltway has been full of whispers about the split between Erdogan and Gul for some time, but this was the first public airing of their differences. It's not that they differ in substance — it's style and rhetoric that puts them apart. In fact, there are even those within the Islamist base, including those close to Gul, who believe Erdogan's rhetoric is creating problems for Turkey's interests. Some believe that this

all might foreshadow a split between Erdogan and Gul in advance of the presidential elections in 2014.

The old Turkey's political system was not accommodating of the Islamist parties. The courts banned almost all of them from politics on charges that they wanted to create a counterrevolution challenging the country's founding principles. Turkey's first Islamist prime minister, Necmettin Erbakan, served in a short-lived coalition from 1996 to 1997 — an era that ended with a military coup known as the "February 28th Process."

Gul and Erdogan, along with a group of others from Erbakan's Welfare Party decided to break away in 1998. They believed Erbakan was scaring the masses and that it would not be possible to regain power with him in the lead. In 2002, Erdogan's AKP came to power as a single party, ending a long period of coalition governments. Since then, the AKP has been elected three times, growing its constituency with each election cycle.

Erdogan has promised his electorate that he won't run for his party's chairmanship again after serving three terms. It is impossible to predict whether Gul and Erdogan could split, but the way forward will likely entail some opposition to Erdogan from within his Islamist base, and he may end up remembering Turkey's 89th birthday as the spoiler of his bigger game. Erdogan's seeking of a referendum to strengthen the AKP's hold in the name of democratic reform would be a setback to Turkish democracy. Many utter that word lazily, and only consider it to mean people casting votes on an election day.

Turkey could use constitutional or democratic reform, for sure, but not along these lines. The time is not ripe, and the political climate in the country is poisonous. Erdogan's rhetoric, once inclusive, is increasingly angry and feverish. There is neither empathy for his critics nor even a feint toward consensus. The bigger game is one to be avoided.

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What did Mahmoud Abbas Say?

Hazem Saghieh

6 November 2012 -- For those who still intend to “liberate Palestine from the Jordan River to the Mediterranean Sea,” President Mahmoud Abbas’s statements about Safad and not residing there is a crime. The reason is that all of historic Palestine “belongs to us”, and that the returnees shall live in any place of their choosing in Palestine. And all this is a plan to be carried out “Now, now, and not tomorrow.”

For such people, Israel, with its might, nuclear arsenal, unbreakable bonds with the Western world, and the universal recognition of its existence, is but a small footnote.

As for those who accept the two-state solution, with an Israeli and Palestinian state, they know that Abbas did not deviate much from the principles that began with the Palestine Liberation Organization (PLO)’s ‘Ten Point Program’ or the ‘Phased Plan’ in the mid-seventies, which culminated in the Madrid Conference of 1991 and then the Oslo Accords in 1993.

If it is true that Abbas’s statement can be understood to be relinquishing the “right of return,” then this is nothing more than a purely tactical mistake because a position like this should be declared in the context of negotiations and bargaining, and not to be offered as a free offering ahead of time.

Beyond that and more importantly, “the right of return” is inconsistent with the two-state solution. If this is true in principle, especially given demographic equilibrium, its validity grows with every passing day: While the Middle East unravels into religious, sectarian and ethnic groups that fear one another, and think of separating from one another, it would take us a great deal of naivety to believe that the Jews of Israel would accept the “return” of 5 to 6 million Palestinians, Arabs and Muslims, to live in their midst.

This is pure delusion whose only purpose is to undermine the two-state solution as a prelude to doing away with it completely. This is particularly

the case when the call for “the right of return” is coupled with threats about numerical and demographic shifts in favor of the Arab population.

In a region that is unable to resolve the question of Kirkuk and whether it is Arab, Kurd or Turkish, the question of the return of Palestinians to the territories of 1948 is closer to being a matter of innocence possessed by a lot of devilry that rejects any kind of peace and does not want to see any end to the suffering of the Palestinian people.

This is while retaining the full right to question the desire of the Palestinian population displaced in 1948 and their descendants to ‘return’ to a place that they are only linked to by means of songs that continue to fall in numbers. Indeed, they have become more Syrian, Lebanese or Jordanian than they are Palestinian, unless of course there is some kind of an immutable Palestinian essence that does not follow the rules of life and history – which is another delusion, naturally.

The Palestinians, whom some like to paint as beings who, as soon as they wake up in the morning begin to think of liberation and return, are imaginary and nonexistent beings. As for what exists in reality, then it is a human being who thinks about issues like his livelihood, daily life, work, citizenship and the education of his children.

Most likely, Mahmoud Abbas was courageous to admit to the mythical nature of such myths. He, more than anyone of us, knows how weak the Palestinians are. Abbas also knows that the Gaza-West Bank split is much more than a “brotherly” misunderstanding between Fatah and Hamas.

The world has been preoccupied away from Palestinian concerns, and now, the Arabs themselves are preoccupied away from Palestine with their local and national concerns, which require tremendous energies to be addressed. In the meantime, Israel is growing more intransigent, arrogant and hawkish, and it is not possible to bet on anything at all without Israel being flexible and willing to compromise.

As for those who still want to “liberate Palestine from the River to the Sea”, then Abbas knows, and we know, that all they have for this purpose is the Ayoub drone, no less, and no more (which is of course made in Iran!)

Hazem Saghieh is political editor of the London-based Arab newspaper al-Hayat.

Beginnings of Bionic

[Meghan Rosen](#)

November 2, 2012 -- Michael McAlpine's shiny circuit doesn't look like something you would stick in your mouth. It's dashed with gold, has a coiled antenna and is glued to a stiff rectangle. But the antenna flexes, and the rectangle is actually silk, its stiffness melting away under water. And if you paste the device on your tooth, it could keep you healthy.

The electronic gizmo is designed to detect dangerous bacteria and send out warning signals, alerting its bearer to microbes slipping past the lips.

Recently, McAlpine, of Princeton University, and his colleagues spotted a single *E. coli* bacterium skittering across the surface of the gadget's sensor. The sensor also picked out ulcer-causing *H. pylori* amid the molecular medley of human saliva, the team reported earlier this year in *Nature Communications*.

At about the size of a standard postage stamp, the dental device is still too big to fit comfortably in a human mouth. "We had to use a cow tooth," McAlpine says, describing test experiments. But his team plans to shrink the gadget so it can nestle against human enamel. McAlpine is convinced that one day, perhaps five to 10 years from now, everyone will wear some sort of electronic device. "It's not just teeth," he says. "People are going to be bionic."

McAlpine belongs to a growing pack of tech-savvy scientists figuring out how to merge the rigid, brittle materials of conventional electronics with the soft, curving surfaces of human tissues. Their goal: To create products that have the high performance of silicon wafers — the crystalline material used in computer chips — while still moving with the body. Beyond detecting bacteria to nip potential illnesses before they begin, such devices could comfortably monitor a person's vital signs and deliver therapeutic treatments.

Unlike Arnold Schwarzenegger's cinematic cyborg, which forced flesh and blood to fuse with a machine base, today's researchers focus on tailoring electronics to fit the human form. One group, led by materials scientist

John Rogers of the University of Illinois at Urbana-Champaign, has created flat electronic “temporary tattoos” that stick to skin. This summer, the researchers invented an electronic finger sleeve that detects movement and touch. Now, a similar technology can hug the heart like cling wrap. Such a device could sense erratic beats and zap a spastic organ back into rhythm. Other inventions, implanted into the brain, might send out microshocks to jolt away an epileptic seizure.

In the last two years, another team, led by Zhenan Bao of Stanford University, has been working toward making stretchy, artificial skins from rubber and carbon nanotubes. The skins will feel like the real thing to the touch — and they will have a sense of touch too, electronically detecting changes in strain and pressure from a stretch or a pinch.

In the short term, flexible, stretchable electronics could help make medical devices smarter, by integrating sensors into sutures, surgical gloves or balloon catheters that feel their way through the passageways of a heart. Incorporating electronics onto (and into) human bodies for everyday use may follow close behind.

“We went from a computer that fit in a room, to a computer that goes on your desk, to a computer that can go in your pocket,” McAlpine says. Joining computers to the body, he says, is “the next logical step.”

Rogers is one of the scientists pushing the field forward. And last year, he put some skin in the game.

Stuck on skin

Silicon wafers are lousy for making skin electronics. “In terms of mechanics,” Rogers says, “they’re basically like a plate of glass.” When the body twists and bends, they break.

But the appeal of silicon is its history. “There’s been a half a century of global research and development to understand how to purify it, dope it, make devices out of it and manufacture with it,” he says.

A typical computer chip has metal wires that carry a current along a rigid silicon base. Components etched into the base control the flow. Rogers’ team is working with the brittle silicon to make it flexible and stretchable enough to ride atop skin. By creating ultrathin silicon ribbons instead of etching into a silicon block, the researchers have produced parts that bend without breaking. Think of how you can roll up a piece of paper but not a wooden board, Rogers says. The paper’s thinness makes it supple.

In his team's epidermal electronic devices, squiggles of silicon ribbons snake across rubbery support surfaces. The squiggles join with gold to form the devices' sensors — for detecting temperature or pressure or strain — and link up in a mesh that puckers and flexes along with the sheet it is mounted to.

One day, a slim skin sticker designed by the team could be used to track a person's health ([SN: 9/10/11, p. 10](#)). It would even be gentle enough for premature babies. The electronic gadget might also be tapped for nonmedical uses: Secret agents with an electronic sticker hidden under a shirt collar could pick up and send out conversations, an extra-covert way to “wear a wire.”

Already, Reebok is working with Rogers to develop a skin-mounted sports monitor designed to move with the body while tracking an athlete's health. Reebok's flexible device straps on instead of stamping on, “but it's a great first step in that direction,” says Rogers.

While gadget lovers wait for the device to debut sometime later this year, Rogers and collaborators have moved beyond flat electronics into a third dimension. In August they reported inventing an electronic “finger tube” — a molded polymer sheath with built-in sensor disks of silicon and gold. For a snug fit, Rogers' team used a 3-D scanner to map a finger's form. He envisions the stretchy tubes will one day top the fingers of smart surgical gloves, to enhance the sense of touch for delicate operations.

Rogers is also teaming up with other researchers to apply the new technology to bigger body parts — such as hearts.

Keep the beat alive

When St. Louis surgeons remove a failing heart from a transplant patient, biomedical engineer Igor Efimov and his colleagues are among the first to know. They take advantage of the heart's last moments of life to test prototypes of a cardiac technology that might one day have the power to heal.

Efimov and his team have joined with Rogers' group to develop the device, which slips around the heart and uses a low-energy method to gently calm spastic tremors. Jittery flutters called atrial fibrillations afflict millions of people worldwide and can bump up stroke risk.

A safe, effective atrial defibrillator exists, but it is bulky, with rigid electrodes and wires that eventually wear out, short-circuit or leak. What's

more, “nobody wants to use it because it’s too painful,” Efimov says. The defibrillator uses so much energy to jump-start a heart that patients describe it as a mule kick to the chest. His team’s method is more like a love tap; it’s pain-free.

Inside the “heart sock” are printed sensors that monitor activity across the surface and stimulators that deliver tiny shocks when needed. And because the sock is light and floppy, it could outlast today’s clunky cardiac equipment.

Recently, Efimov and colleagues have begun testing prototypes on donated human hearts. A partnership between Barnes Jewish Hospital and Efimov’s lab at Washington University, both in St. Louis, delivers sick hearts from patients to scientists. When transplant patients get new hearts, researchers get to experiment on the old ones.

“It’s a good deal,” Efimov says. After the heart is pulled from the body and unhooked from its blood supply, the researchers have a short window of time before the heart shuts down. They shuttle it to the lab and conduct their experiments, laying pieces of prototype heart sock material on the organ to measure electrical activity and other properties. In the team’s sensing tests so far, he says, it is “working really wonderfully.”

Efimov has also stimulated rabbit hearts with a more complete version of the sock, and is planning to try it on the hearts of living dogs — the best animal model for human atrial fibrillation, according to Efimov. With so many people worldwide relying on defibrillators and other implanted heart devices, Efimov sees an obvious market.

Though Efimov focuses on cardiac therapy, he has ideas for other uses for the technology. Scientists could use related devices on muscles or bones, he says, or to hook up human brains to the Internet. “There are so many applications,” he says. “It’s just amazing.”

Handle with silk

A Web-browsing brain may sound like science fiction, but researchers have already figured out how to implant flat chips into the human brain to pick up neural signals and turn them into actions ([SN: 7/2/11, p. 26](#)).

But forcing flat electronics to lay against the soft, sloping surface of the brain is a delicate and tricky task. The device must physically touch the cortex and be stiff enough that surgeons can pass it through tiny openings in the skull. One of the best current technologies taps into neural activity

by jabbing sharp pins into the brain where they contact clumps of brain cells. The pins mount to a rigid silicon chip.

Though easy to handle, today's approaches irritate the tissue and can trigger long-term inflammation. Low-profile devices that instead sink into the brain's crevices and work with its micromovements — bulges, contractions and pulses — could be less traumatic and longer lasting. If scientists can figure out how to work with them.

“You can't really hold or manipulate the device very well because it's so thin and flexible and sloppy that it's not even self-supporting,” Rogers says. “So how do you move it around?”

One answer is silk. As with McAlpine's tooth sensor, thin films of silk may help scientists get a grip on flexible electronics. Because the films are stiff when dry, researchers can add a layer of mesh circuits and easily maneuver the films through holes in the skull and onto the brain. Doused with fluid, the film dissolves and the circuit snuggles against the brain's folds. Since the silk doesn't bother the body, film remnants can flush safely into the skull cavity ([SN: 11/3/12, p. 15](#)).

“It eventually degrades, and the body has a very low immune response to it,” says biomedical engineer Fiorenzo Omenetto. To make the films, Omenetto and his team at Tufts University in Medford, Mass., process silk into its basic protein ingredients. First, they chop up silkworm cocoons, and then they boil the bits in a salt solution to break down the fibers. “It's like making pasta,” Omenetto says. At the end of the entire process, what's left is a mixture of water and fibroin — a versatile silk protein that scientists can form into almost anything, including thin sheets.

In 2010, Rogers, Omenetto and colleagues tested a silk-coupled electronic device on a feline brain. They placed the silk-backed mesh circuit onto the visual cortex of an anesthetized cat and monitored brain activity. Compared to thicker devices, the mesh molded more closely to the brain and recorded stronger signals. In people, such flexible devices may one day control prosthetic arms, map brain activity or quell seizures in epileptic patients.

All-in skin

Instead of trying to make traditional electronic materials flexible, Stanford's Bao and colleagues are turning the goal around: They're trying to make flexible materials electronic. By layering thin textured films with

carbon nanotubes, Bao and her colleagues are figuring out how to make touch-sensitive artificial skin — no rigid parts required.

Today's ultrasensitive strain sensors are built with a thin layer of silicon film. Pressing on the film changes the amount of current zipping through it, allowing the pressure to be measured. The gadgets are very sensitive, Bao says, but also very fragile. For the applications she is interested in, fragile doesn't work: "A lot of wear and tear will easily damage those kinds of devices."

In 2010, Bao's team made a sensing system that works a little differently by sandwiching a layer of microstructured rubber between two charge-holding metal grids. When pressure is applied to the grids, the amount of charge changes. The pattern of holes carved into the rubber bumped up its sensitivity: Even a butterfly-light touch compressed the cutouts, Bao and colleagues reported in *Nature Materials*.

Of course, metal tends to crack when bent. So last year, the researchers figured out how to give the sandwich's bread layers a little stretch.

They replaced the metal grids with carbon nanotubes, thin carbon wires that can handle extreme bending and still conduct a current. In this version, the sandwich's middle was a flat rubber film that wasn't so sensitive, but combining the technologies and spotting the resulting sandwiches onto another material could yield sensitive, stretchable artificial skin.

Such skin may one day patch areas of real flesh damaged by burns, for example. "Twenty years from now," Bao says, "I can definitely see some flexible sensor sheet that looks just like human skin and can be grafted onto wounds and function like real skin."

In many ways, Bao's artificial skin behaves like the real thing. But it has one big hurdle to clear: It still uses wires to send its messages to a computer. If the skin ever made its way into a prosthetic, it would need to relay signals wirelessly to the wearer's brain. "Ultimately we want the sensors to be talking directly to the neurons," Bao says.

She imagines a future in which a person's electronic skin and other implanted devices link up. A world where a fly lands on the artificial skin of a person's arm, which speaks to an electronic device in the brain, which tells the person to shoo the bug away with a flick of a supersensitive finger. Today, researchers are buzzing along building bits of electronics that can be integrated into the body. Someday soon, they may cobble the pieces

together and get them to converse in a truly bionic being.