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<a href="#">Article 1.</a>	Spiegel <b><u>Secret Cooperation -- Israel Deploys Nuclear Weapons on German-Built Submarines</u></b>
<a href="#">Article 2.</a>	The Moscow Times <b><u>Russia's Role in the Houla Massacre</u></b> <a href="#">Alexander Shumilin</a>
<a href="#">Article 3.</a>	The Daily Star <b><u>When Syria sneezes Lebanon gets the flu</u></b> Murhaf Jouejati
<a href="#">Article 4.</a>	The Wall Street Journal <b><u>A Settlement Freeze Can Advance Israeli-Palestinian Peace</u></b> <a href="#">Alan M. Dershowitz</a>
<a href="#">Article 5.</a>	NYT <b><u>Mutually Assured Cyberdestruction?</u></b> <a href="#">David E. Sanger</a>
<a href="#">Article 6.</a>	Project Syndicate <b><u>Exit the Political Wife</u></b> Naomi Wolf
<a href="#">Article 7.</a>	The Wall Street Journal <b><u>Bionic Brains and Beyond</u></b> <a href="#">Daniel H. Wilson</a>

Article 1.

Spiegel

## **Secret Cooperation -- Israel Deploys Nuclear Weapons on German-Built Submarines**

06/03/2012 -- A German shipyard has already built three submarines for Israel, and three more are planned. Now SPIEGEL has learned that Israel is

arming the submarines with nuclear-tipped cruise missiles. The German government has known about Israel's nuclear weapons program for decades, despite its official denials.

Germany is helping Israel to develop its military nuclear capabilities, SPIEGEL has learned. According to extensive research carried out by the magazine, Israel is equipping submarines that were built in the northern German city of Kiel and largely paid for by the German government with nuclear-tipped cruise missiles. The missiles can be launched using a previously secret hydraulic ejection system. Israeli Defence Minister Ehud Barak told SPIEGEL that Germans should be "proud" that they have secured the existence of the state of Israel "for many years."

In the past, the German government has always stuck to the position that it is unaware of nuclear weapons being deployed on the vessels. Now, however, former high-ranking officials from the German Defense Ministry, including former State Secretary Lothar Rühl and former chief of the planning staff Hans Rühle, have told SPIEGEL that they had always assumed that Israel would deploy nuclear weapons on the submarines. Rühl had even discussed the issue with the military in Tel Aviv.

Israel has a policy of not commenting officially on its nuclear weapons program. Documents from the archives of the German Foreign Ministry make it clear, however, that the German government has known about the program since 1961. The last discussion for which there is evidence took place in 1977, when then-Chancellor Helmut Schmidt spoke to then-Israeli Foreign Minister Moshe Dayan about the issue.

The submarines are built by the German shipyard HDW in Kiel. Three submarines have already been delivered to Israel, and three more will be delivered by 2017. In addition, Israel is considering ordering its seventh, eighth and ninth submarines from Germany.

The German government recently signed the contract for the delivery of the sixth vessel. According to information obtained by SPIEGEL, Chancellor Angela Merkel made substantial concessions to the Israelis. Not only is Berlin financing one-third of the cost of the submarine, around €135 million (\$168 million), but it is also allowing Israel to defer its payment until 2015.

Merkel had tied the delivery of the sixth submarine to a number of conditions, including a demand that Israel stop its expansionist settlement

policy and allow the completion of a sewage treatment plant in the Gaza Strip, which is partially financed with German money. So far, Israeli Prime Minister Benjamin Netanyahu has met none of the terms.

*Check back on SPIEGEL International on Monday for the full English-language version of SPIEGEL's cover story on Germany's cooperation with Israel over its submarine program.*

Article 2.

The Moscow Times

## **Russia's Role in the Houla Massacre**

[Alexander Shumilin](#)

04 June 2012 -- The Syrian problem has become a vicious vortex sucking the Russian ship downward into its maw. Foreign Minister Sergei Lavrov last week sent a few subtle signals that the Kremlin might be trying to distance itself from Syrian President Bashar Assad, but to no avail. Assad turns to Russia for support, and the Kremlin involuntarily obliges. Russia has become a captive of the situation that it has created itself. This became clear immediately after the tragic massacre of civilians in the Syrian village of Houla on May 25 that left about 116 civilians dead, including dozens of children. Lavrov cannot deny the evidence presented by the United Nations that the heinous crime was committed by government forces. At the same time, however, he cannot turn his back on Assad and his regime. His solution was to try to sit on both sides of the fence: recognizing the involvement of government forces in Houla while demanding a full investigation into the role played by rebel forces in the tragedy.

Nobody denies the role that the rebels have played in the Syrian conflict. A civil war is raging in the country, and the opposition openly refers to itself as a militia. The question is not whether the opposition fired first, but how the government's army responded. Is it admissible to retaliate against enemy fire by intentionally bombing civilian neighborhoods

and killing innocent women and children simply because that population is sympathetic to the opposition?

As a result, the Foreign Ministry cannot provide any evidence backing up its oft-repeated claim that Moscow is only defending the principles of justice for the Syrian people and that it has not supported the Assad regime against the rebel forces. No sooner does the Foreign Ministry try to position itself as a neutral player cooperating with the UN than another massacre takes place. Assad then appeals to Moscow for support, and the whole cycle begins anew.

Defending Assad had always been part of President Vladimir Putin's anti-Western campaign rhetoric to curry favor with his conservative constituency. Moscow's support for Assad had disastrous results, particularly between Feb. 4, when Russia vetoed the UN draft resolution on Syria put forward by the Arab states, and March 5, when Putin was elected president. During this period of Russian protection, Assad's regime escalated the conflict by bombing major population centers considered to be strongholds of opposition rebels.

In a campaign stunt designed to vex Western governments and win votes at home, Putin had additional weapons delivered to Assad during this period. As a result, by March 5, government forces had decisively broken the backbone of the rebels and began to feel that they had established control in the country.

Assad is obviously incapable of restoring order with anything but heavy guns. There is no hope for a peaceful solution as long as he remains in power. But what will be the outcome of Russia's attempts to whitewash and justify his crimes? How can Russia prove that it is not defending a bloody dictator?

By all indications, the Kremlin does not view events in Syria as a serious crisis and intends to play its Syria card in negotiations with the West in an attempt to wrest concessions on key issues in the U.S.-Russian dialogue, such as missile defense in Europe or a softening of the West's moral and political support for the protest movement in Russia.

Since these types of concessions from Washington are unlikely, this means that Russia will probably continue its reckless course of supporting the Assad regime — until there are a few more massacres like Houla.

*Alexander Shumilin is the director of the Center for the Analysis of Middle East Conflicts at the Institute for U.S. and Canadian Studies at the Russian Academy of Sciences.*

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Article 3.

The Daily Star

## **When Syria sneezes Lebanon gets the flu**

Murhaf Jouejati

June 04, 2012 -- According to an old Levantine dictum, when Syria sneezes Lebanon gets the flu. Part of the reason is that Lebanon, Syria's smaller neighbor, is populated by extensions of Syria's rival political and sectarian groups. With the crisis in Syria now at its apex following 15 months of a popular uprising against the Assad regime, Syria is not only sneezing, it may be suffering from pneumonia. Despite Lebanese Prime Minister Najib Mikati's "dissociation policy" – an attempt to prevent the Syrian affliction from infecting his county – Lebanon is increasingly getting sucked into the intra-Syrian conflict.

In addition to the assassination of anti-Assad Lebanese politicians and journalists and the abductions of a score of Lebanon-based Assad opponents, Syrian security forces have regularly staged incursions into Lebanese territory in hot pursuit of fleeing Syrian rebels while the far smaller Lebanese Army looked the other way. Syrian security forces have shelled Lebanese border villages suspected of smuggling arms and/or providing shelter to anti-Assad rebels, killing scores of Lebanese bystanders in the process. This is to say nothing of the economic and political impact on Lebanon of the tens of thousands of ordinary Syrians who have flocked to that country for refuge.

As the violence in Syria escalates and the collapse of his regime approaches, President Bashar Assad, in desperation, will do all he can to

destabilize Lebanon – never mind the catastrophic regional repercussions this entails. Assad’s strategy is to threaten civil war in Lebanon so as to deter the international community from dislodging his regime by force, as it did with Moammar Gadhafi’s regime in Libya.

Although no firm evidence links recent events in Lebanon with Syrian skullduggery, the arrest by Syria-friendly Lebanese intelligence agents of Shadi al-Mawlawi, a Sunni Lebanese anti-Assad activist allegedly involved in the trafficking of arms to the Free Syrian Army, and the killing by similarly friendly Lebanese Army personnel of Sheikh Ahmad Abdul-Wahed, a Sunni anti-Assad cleric who apparently did not heed the order to stop at a checkpoint, are no coincidences. That these twin episodes set off deadly street battles between Lebanese pro- and anti-Assad activists in Lebanon’s two largest cities, Beirut and Tripoli, and that the funeral procession for Abdul-Wahed drew thousands of people who fired their rifles in the air as a sign of mourning, are exactly the kind of instability Assad is trying to foment next door.

That Assad is keen on sowing chaos in Lebanon to ensure his survival and that of his Alawite-dominated regime should not come as a surprise. By killing his own people in the thousands for opposing his continued authoritarian rule; by forcing the militarization of an otherwise peaceful Syrian revolution through untold, brute force; and by coaxing Syria’s religious minorities into believing that their bleak destiny is in the hands of so-called “vengeful Salafists” should his “secular” regime collapse, Assad has shown that he will stop at nothing to maintain his power and the privileges (mostly illicit) that come with it.

But while it is not very hard for Assad to fish in Lebanon’s muddy sectarian waters, the Syrian dictator is finding it more difficult than usual to get his Lebanese allies to do his bidding. Lebanon is still exhausted from its past travails, including a 16-year civil war and a devastating slugfest between Hezbollah and Israel, both of which left their scars on Lebanon’s psyche, not to mention its physical infrastructure. Accordingly, despite skirmishes here and there the Lebanese body politic has no appetite for another war.

In spite of its pro-Assad leanings, the Lebanese government has thus far been able to contain some of the fires: Mawlawi’s sudden release on bail is one case in point; the Lebanese Army’s apology for the killing of Sheikh

Abdul-Wahed is another. Even Hezbollah leader Sayyed Hasan Nasrallah, a seemingly die-hard supporter of the Assad regime, appealed for calm when some of his Shiite co-religionists were kidnapped in Aleppo while on their way to Lebanon from a pilgrimage in Iran.

Still, despite its current attempts to stay out of the Syrian conflict, one should not discount Lebanon's propensity to descend into chaos. It would not be the first time Lebanon is the theater for proxy wars. In this particular instance, the longer the crisis in Syria, the greater the likelihood Lebanon will be engulfed in war. International statements urging both sides of the Lebanese divide to exercise restraint may be too little, too late. What is urgently needed is for the international community, in tandem with the Syrian opposition, to remove the Assad regime before Assad causes further death and destruction in both Syria and Lebanon.

*Murhaf Jouejati is professor of Middle East studies at the National Defense University's NESAC Center for Strategic Studies. He also teaches at The George Washington University and is a scholar at the Middle East Institute.*

Article 4.

The Wall Street Journal

## **A Settlement Freeze Can Advance Israeli-Palestinian Peace**

[Alan M. Dershowitz](#)

June 3, 2012 -- Now that Israel has a broad and secure national unity government, the time is ripe for that government to make a bold peace offer to the Palestinian Authority.

The Palestinian Authority refuses to negotiate unless Israel accepts a "freeze" on settlement building in the West Bank. Israel accepted a 10-month freeze in 2009, but the Palestinian Authority didn't come to the bargaining table until weeks before the freeze expired. Its negotiators demanded that the freeze be extended indefinitely. When Israel refused, they walked away from the table.

There is every reason to believe that they would continue such game-playing if the Israeli government imposed a similar freeze now, especially in light of current efforts by the Palestinian Authority and Hamas to form their own unity government, which would likely include elements opposed to any negotiation with the Jewish state.

That is why Prime Minister Benjamin Netanyahu should now offer a conditional freeze: Israel will stop all settlement building in the West Bank as soon as the Palestinian Authority sits down at the bargaining table, and the freeze will continue as long as the talks continue in good faith.

The first issue on the table should be the rough borders of a Palestinian state. Setting those would require recognizing that the West Bank can be realistically divided into three effective areas:

- Those that are relatively certain to remain part of Israel, such as Ma'ale Adumim, Gilo and other areas close to the center of Jerusalem.
- Those that are relatively certain to become part of a Palestinian state, such as Ramallah, Jericho, Jenin and the vast majority of the heavily populated Arab areas of the West Bank beyond Israel's security barrier.
- Those reasonably in dispute, including some of the large settlement blocs several miles from Jerusalem such as Ariel (which may well remain part of Israel, but subject to negotiated land swaps).

This rough division is based on prior negotiations and on positions already articulated by each side. If there can be agreement concerning this preliminary division—even tentative or conditional—then the settlement-building dispute would quickly disappear.

There would be no Israeli building in those areas likely to become part of a Palestinian state. There would be no limit on Israeli building within areas likely to remain part of Israel. And the conditional freeze would continue in disputed areas until it was decided which will remain part of Israel and which will become part of the new Palestinian state. As portions of the disputed areas are allocated to Palestine or Israel, the building rules would reflect that ongoing allocation.

I recently proposed this idea to a high-ranking Israeli official. His initial reaction was mostly positive, but he insisted that it would be difficult to impose an absolute building freeze in any areas in which Israelis currently live. He pointed out that families grow and that new bedrooms and bathrooms are needed in existing structures as a simple matter of

humanitarian needs. I reminded him that Mr. Netanyahu has repeatedly stated that Israel is prepared to make "painful compromises" in the interests of peace.

An absolute building freeze would be such a painful but necessary compromise. It might also encourage residents of settlements deep in the West Bank to move to areas that will remain part of Israel, especially if the freeze were accompanied by financial inducements to relocate.

Such a proposal by Israel would be an important first step and a good test of the bona fides of the Palestinian side. Since their precondition to negotiation will have been met by the promise of a freeze (to begin the moment they sit down to negotiate), they would have no further excuse for refusing the Israeli offer to try to resolve the conflict.

The conditional freeze would also test the bona fides of the Israeli government, which would no longer have the excuse that any freeze would risk toppling a fragile coalition that relies on right-wingers who have threatened to withdraw in the event of another freeze. The new national unity government is now sufficiently large and diverse that it could now survive a walk-out by elements opposed to any freeze.

Once the parties reach a preliminary agreement regarding the three areas and what could be built where, they could get down to the nitty-gritty of working on compromises to produce an enduring peace.

These compromises will require the Israelis to give up claims to areas of the West Bank that were part of Biblical Israel but that are heavily populated by Palestinians. It will require the Palestinians to give up any claim to a massive "right of return" for the millions of descendents of those who once lived in what is now Israel. It will require an agreement over Jerusalem, plus assurances about Israel's security in the Jordan Valley and in areas that could pose the threat of rocket attacks like those that have come from the Gaza Strip in recent years.

Both sides say they want peace. In my conversations with both Israeli and Palestinian leaders, I have repeatedly heard the view that "everyone" knows what a pragmatic, compromise resolution will look like. Each side claims that the other side has erected artificial barriers to reaching that resolution.

If the building freeze issue can be taken off the table, one of the most controversial and divisive barriers will have been eliminated. The Israeli

government should take the first step, but the Palestinian Authority must take the second step by immediately sitting down to negotiate in good faith.

*Mr. Dershowitz is a law professor at Harvard. His latest book is "Trials of Zion" (Grand Central Publishing, 2010).*

Article 5.

NYT

## **Mutually Assured Cyberdestruction?**

[David E. Sanger](#)

June 2, 2012 -- IT took years after the United States dropped the atomic bomb on Hiroshima for the nation to develop a common national understanding of when and how to use a weapon of such magnitude. Not until after the Cuban Missile Crisis, 50 years ago this October, did a consensus emerge that the weapon was too terrible ever to employ again, save as a deterrent and a weapon of last resort.

Over the past decade, on a far smaller scale, the country's military and intelligence leadership have gone through a parallel debate about how to use the [Predator drone](#). Because it is precisely targeted, often on an individual, it is used almost every week. And now we know that [President Obama](#), for the past three years, has been going through a similar process about how America should use another innovative weapon — one whose destructive powers are only beginning to be understood. In a secret program called "Olympic Games," which dates from the last years of the George W. Bush administration, the United States has mounted repeated attacks with the most sophisticated cyberweapons ever developed. Like drones, these weapons cross national boundaries at will; in the case of Olympic Games they invaded the computer controllers that run [Iran's](#) nuclear centrifuges, spinning them wildly out of control. How effective they have been is open to debate; the United States and its close partner in the attacks, Israel, used the weapons as an alternative to a potentially far

more deadly, but perhaps less effective, bombing attack from the air. But precisely because the United States refuses to talk about its new cyberarsenal, there has never been a real debate in the United States about when and how to use cyberweapons.

President Obama raised many of the issues in the closed sanctum of the Situation Room, participants in the conversation say, pressing aides to make sure that the attacks were narrowly focused so that they did not take out Iranian hospitals or power plants and were directed only at the country's nuclear infrastructure. "He was enormously focused on avoiding collateral damage," one official said, comparing the arguments over using [cyberwar](#) to the debates about when to use drones. Does the United States want to legitimize the use of cyberweapons as a covert tool? Or is it something we want to hold in reserve for extreme cases? Will we reach the point — as we did with chemical weapons, and the rest of the world did with land mines — that we want treaties to ban their use? Or is that exactly the wrong analogy, in a world in which young hackers, maybe working on their own or maybe hired by the Chinese People's Liberation Army or the Russian mob, can launch attacks themselves? These are all fascinating questions that the Obama administration resolutely refuses to discuss in public. "They approached the Iran issue very, very pragmatically," one official involved in the discussions over Olympic Games told me. No one, he said, "wanted to engage, at least not yet, in the much deeper, broader debate about the criteria for when we use these kinds of weapons and what message it sends to the rest of the world." Cyberweapons, of course, have neither the precision of a drone nor the immediate, horrifying destructive power of the Bomb. Most of the time, cyberwar seems cool and bloodless, computers attacking computers. Often that is the case. The Chinese are believed to attack America's computer systems daily, but mostly to scoop up corporate and Pentagon secrets. (Mr. Obama, one aide said, got a quick lesson in the scope of the problem when an attack on his 2008 campaign's computers was traced back to China, a foretaste of what happened to Google the following year.) The United States often does the same: the Iranians reported last week that they had been hit by another cyberattack, called "Flame," that appeared to harvest data from selected laptop computers, presumably those of Iranian leaders and scientists. Its origins are unclear. But the cutting edge of cyberwar is in the invasion of computer

systems to manipulate the machinery that keeps the country going — exactly what the United States was doing to those Iranian centrifuges as it ran Olympic Games. “Somebody has crossed the Rubicon,” Gen. Michael V. Hayden, the former director of the C.I.A., said in describing the success of the cyberattacks on Iran. General Hayden was careful not to say what role the United States played, but he added: “We’ve got a legion on the other side of the river now. I don’t want to pretend it’s the same effect, but in one sense at least, it’s August 1945,” the month that the world first saw the capabilities of a new weapon, dropped over Hiroshima and Nagasaki. That was deliberate overstatement, of course: the United States crashed a few hundred centrifuges at Natanz, it did not vaporize the place. But his point that we are entering a new era in cyberattacks is one the administration itself is trying to make as it ramps up American defenses. Defense Secretary Leon E. Panetta — a key player in the Iran attacks — warned last year that the “next Pearl Harbor we confront could very well be a cyberattack that cripples our power systems, our grid, our security systems, our financial systems.”

IN March the White House invited all the members of the Senate to a classified simulation on Capitol Hill demonstrating what might happen if a dedicated hacker — or an enemy state — decided to turn off the lights in New York City. In the simulation, a worker for the power company clicked on what he thought was an e-mail from a friend; that “spear phishing” attack started a cascade of calamities in which the cyberinvader made his way into the computer systems that run New York’s electric grid. The city was plunged into darkness; no one could find the problem, much less fix it. Chaos, and deaths, followed. The administration ran the demonstration — which was far more watered-down than the Pentagon’s own cyberwar games — to press Congress to pass a bill that would allow a degree of federal control over protecting the computer networks that run America’s most vulnerable infrastructure. The real lesson of the simulation was never discussed: cyberoffense has outpaced the search for a deterrent, something roughly equivalent to the cold-war-era concept of mutually assured destruction. There was something simple to that concept: If you take out New York, I take out Moscow.

But there is nothing so simple about cyberattacks. Usually it is unclear where they come from. That makes deterrence extraordinarily difficult.

Moreover, a good deterrence “has to be credible,” said Joseph S. Nye, the Harvard strategist who has written the [deepest analysis yet](#) of what lessons from the atomic age apply to cyberwar. “If an attack from China gets inside the American government’s computer systems, we’re not likely to turn off the lights in Beijing.” Professor Nye calls for creating “a high cost” for an attacker, perhaps by naming and shaming. Deterrence may also depend on how America chooses to use its cyberweapons in the future. Will it be more like the Predator, a tool the president has embraced? That would send a clear warning that the United States was ready and willing to act. But as President Obama warned his own aides during the secret debates over Olympic Games, it also invites retaliatory strikes, with cyberweapons that are already proliferating. In fact, one country recently announced that it was creating a new elite “Cybercorps” as part of its military. The announcement came from Tehran. The chief Washington correspondent for The New York Times. This article is adapted from his new book, “Confront and Conceal: Obama’s Secret Wars and Surprising Use of American Power.”

Article 6.

Project Syndicate

## **Exit the Political Wife**

Naomi Wolf

31 May 2012 -- France’s new president, François Hollande, is not married to his partner, the glamorous political journalist Valerie Trierweiler, and no one seems to care. Germany’s president, Joachim Gauck, is not married to his partner, the journalist Daniela Schadt, and no one seems to care.

Andrew Cuomo, the governor of New York, is not married to his partner, the domesticity guru Sandra Lee, and no one seems to care. The list could easily be continued.

Is the adoring political spouse – so much a part of the political landscape that she has her own iconography, from knit suits to the dreamy upward gaze at her man – receding into the past?

It is true that in America, at least, hay can still be made from the role of political wife. President Barack Obama may have experienced his first

major dip in the polls – and his first real slide with women voters – when a partisan supporter, Hilary Rosen, said that Republican presidential candidate Mitt Romney’s wife, Ann Romney, had never worked a day in her life. But the response to Rosen’s remark underscored the relative absence of the usual heightened scrutiny of the political wife’s hair and clothes, profession and cookie recipe.

It was only 20 years ago that, during Bill Clinton’s first presidential campaign, his wife Hillary’s career – that is, the fact that she had one of her own – sparked wild and vituperative debate. There was even her absurd “bake-off” against First Lady Barbara Bush, in which she had to produce her own cookie recipe in order to appease a lingering cultural demand for domesticity in the role.

Those days now seem like another age. In America in this election cycle, as in Europe, headlines are absent that in the past would have raised questions about an unmarried female partner, a working woman, a woman with a life of her own.

So, what accounts for the sudden disappearance of the adoring political wife?

The role achieved its apotheosis with someone who, perhaps not coincidentally, was trained as an actress. Nancy Reagan codified the misty-eyed gaze at the rugged man, the demure demurrals, and the aggregation of power behind the throne, while claiming, in interviews, interest in nothing more serious than the White House’s latest china patterns. “I don’t talk about political matters,” she famously said. “That’s not my department.” It is not surprising that this role has recently vanished. For starters, recent events have made it highly unappealing to any woman who has any alternative to assuming it. In recent years, the role of the traditional spouse has been, most visibly, to stand by (or not) while some excruciatingly embarrassing foible or betrayal by one’s husband is publicly aired in mortifying detail.

What woman would want to risk that role – one that has become increasingly likely in an age when surveillance by political opponents has become increasingly sophisticated and extensive? Smart women may be unwilling to marry high-profile political men these days, owing to the tremendous potential downside. Other domestic arrangements might be

easier than taking the matrimonial plunge, with its prospect of thankless exposure in the event of a scandal.

Another reason for the not-necessarily-married and not-necessarily-full-time political spouse has to do with simple generational change: the role of adoring wife that Nancy Reagan perfected is a time-consuming profession. Most men who are ready to seize the reins of national power will be with women of their own generation, who are likely to have plenty to do on their own trajectory. We do have Clinton (as fraught and self-involved as her journey around these issues was) and Cherie Blair to thank for clearing away the cultural detritus.

In a way, voters may find this evolution reassuring: when every male politician had to be equipped with a smart but underemployed full-time adoring wife, there was reason to be uneasy about the unseen influence of an unelected adviser hovering around cabinet meetings. But when a political leader's partner is a full-time journalist – or a full-time lifestyle guru – one's fears of a power behind the throne diminish: the woman, presumably, is too busy to meddle excessively in affairs of state.

Finally, what smart contemporary woman wants to take on a one-step-down role? It is taxing to spend all of one's time making one's husband look good, and it is demeaning to have to feign a lack of interest in issues that doubtless were part of the attraction to one another in the first place. If the traditional political wife is vanishing, it is voters' own fault: we set it up to be a thankless and infantilizing position. Why should we expect our leaders' partners to perform, on a massive public stage, social roles that we no longer accept in our own lives? The adoring political wife was always more caricature than character. Now, fortunately, she can finally retire.

*Naomi Wolf is a world-renowned public intellectual who played a leading role in so-called "third-wave" feminism and as an advocate of "power feminism," which holds that women must assert themselves politically in order to achieve their goals. She has advised the presidential campaigns of Bill Clinton and Al Gore. Her books include The Beauty Myth and The End of America.*

# **Bionic Brains and Beyond**

[Daniel H. Wilson](#)

June 1, 2012 -- Oscar Pistorius comes out of the starting blocks in a race last year. In 2008, the South African sprinter was barred from competition; scientists successfully argued that the advantages of his prosthetics were offset by the disadvantages of being an amputee. He is now one race away from the London Olympics.

The National Spelling Bee of 2023 started out like any other, but controversy enveloped the contest when Suzy Hamilton, an 8-year-old from Tulsa, emerged as the new champion. Contestants had been getting younger for years; that was nothing new. But midway through the event it was discovered that Suzy was—in the words of one commentator—"amped." At the age of 4, suffering from seizures and severe attention and behavioral problems, Suzy had received an experimental new treatment: a neural implant that prevented her seizures and helped her to focus. As it turned out, the device also appeared to make her a prodigy at memorization, as her parents and teachers soon discovered.

Was this youngest-ever winner fully human or was she part machine? Was it fair for her to be in a competition with peers made of mere flesh and blood? The lawsuits soon hit the courts. A new battle over civil rights—over the very definition of the word "human"—had begun.

Sounds far-fetched? It isn't. Over the next decade, new implantable technologies will fundamentally alter the social landscape. We are fast approaching a milestone in the eons-long relationship between human beings and their technology. Families once gathered around the radio like it was a warm fireplace. Then boom boxes leapt onto our shoulders. The Sony Walkman climbed into our pockets and sank its black foam tentacles into our ears. The newest tools are creeping still closer: They will soon come inside and make themselves at home under our skin—some already have.

These tools aren't sinister. They're being created to solve real problems. Simply put, prosthetic limbs help people move, and neural implants help people think. But these days the technology can solve our problems and

then some. Solutions may not only erase physical or mental deficits but leave patients better off than "able-bodied" folks. The person who has a disability today may have a superability tomorrow.

In my new novel "Amped," these implants create a class of superabled people whose capacities destabilize society at large, sparking a full-on civil rights movement. The book was inspired by watching super-enabling technologies creep into society through those who need them most, such as amputees and those who suffer from blindness, deafness or serious brain injuries. But such enhancements will almost inevitably become elective, and then we will face some tough decisions. Should we have an unlimited sovereign right to upgrade our own bodies? Or should such decisions be heavily regulated?

The conversation may be jump-started as early as this summer, on the glaring international stage of the Olympics. The poster boy for our superabled future is Oscar Pistorius, an increasingly famous South African sprinter who happens to have had both of his legs amputated below the knee. Using upside down question mark-shaped carbon fiber sprinting prosthetics, called Cheetah blades, Mr. Pistorius can challenge the fastest sprinters in the world. He is currently just one race away from representing South Africa in London. Whether or not to allow Mr. Pistorius to compete is no longer the issue. In 2008, he was barred from competition by the International Association of Athletics Federations. He responded by putting together an all-star team of scientists who successfully lobbied to have the decision reversed. If Mr. Pistorius can qualify (he is currently the only South African to have beaten the Olympic qualifying time of 45.30 seconds for the 400-meter), he will become the first amputee runner to compete in the Games.

The scientists convincingly argued that the advantages of Mr. Pistorius using his Cheetah blades were offset by the disadvantages of being a double amputee. But prosthetic technology is quickly improving to a point where the balance could tilt the other way. The prosthetic of tomorrow, made of advanced materials like carbon fiber and titanium and controlled by brain implants that could provide intuitive neural control, may well be a living, breathing limb, complete with a sense of touch and the ability to react intelligently to a changing environment. In the highest echelons of

sports, merely "able-bodied" athletes may no longer be able to compete effectively.

Such scenarios are likely to play out in a range of fields. Some people will consider the superabled to be cheaters, using technology to break the rules. Others will see them as tenacious contenders with the audacity to overcome grave obstacles. Regardless, the world will soon bear witness to an epic realignment of the relationship between "disabled" and "abled." The issue is especially relevant to the thousands of military families now dealing with an influx of amputees returning from Afghanistan and Iraq. In many cases, young and physically active veterans are looking beyond fitting in, considering instead how to wring the maximum amount of performance from an array of prosthetic tools designed for tasks ranging from sprinting to ice climbing.

The goal for many amputees is no longer to reach a "natural" level of ability but to exceed it, using whatever cutting-edge technology is available. As this new generation sees it, our tools are evolving faster than the human body, so why obey the limits of mere nature?

While researching the lives of such amputees for my novel, I spoke to DeWalt Mix, who at the age of 27 was in a devastating motorcycle accident. Two years after the accident, he made the difficult decision to have his severely injured left leg amputated below the knee and replaced with a prosthesis made of carbon fiber and steel. Lamenting that no prosthesis can duplicate the adaptability of a natural limb, he says, "If I can't have it closely mimic the capabilities of the original, then I want something much better."

Industry is taking notice. In February 2012, Nike teamed with orthopedics company Össur to introduce its first sprinting prosthesis, called the "Nike Sole." Endorsed by the amputee triathlete Sarah Reinertsen, the carbon fiber blade is featured in commercials that focus on overcoming adversity. "I don't think about it," Ms. Reinertsen says in one of the spots. "I just run." Other mainstream sports and fashion companies are sure to follow suit. Prosthetic limbs aren't the only technology undergoing a renaissance—neural implants are also rapidly maturing, promising to provide mental augmentation rather than physical.

Neural implants, also called brain implants, are medical devices designed to be placed under the skull, on the surface of the brain. Often as small as

an aspirin, implants use thin metal electrodes to "listen" to brain activity and in some cases to stimulate activity in the brain. Attuned to the activity between neurons, a neural implant can essentially "listen" to your brain activity and then "talk" directly to your brain.

If that prospect makes you queasy, you may be surprised to learn that the installation of a neural implant is relatively simple and fast. Under anesthesia, an incision is made in the scalp, a hole is drilled in the skull, and the device is placed on the surface of the brain. Diagnostic communication with the device can take place wirelessly. When it is not an outpatient procedure, patients typically require only an overnight stay at the hospital.

Existing neural implants treat serious conditions. Cochlear implants can deliver sound collected from an external microphone directly to the auditory nerve and into the brain. According to the U.S. Food and Drug Administration, over 200,000 people already use cochlear implants worldwide. Other neural implants act as "brain pacemakers," performing deep brain stimulation to treat people with Parkinson's disease. Yet others can be trained to recognize when epileptic seizures are about to occur and then deliver stimulation to the brain to stop the incipient frenzy of brain activity. But research is going further.

In the future, it will be feasible for an implant to recognize almost anything. For instance, it could detect inattention. In response, the implant could stimulate the brain toward a state of focused attention. Recently, researchers at the Institute of Neurology at University College London stimulated the brains of human subjects to push the brain toward beta band frequencies associated with focus to study the effects on motor processing, with the hope of helping those with Parkinson's disease. In an elective setting, a user with this type of implant could potentially choose to stay focused on command, while constantly strengthening circuits of the brain associated with concentration.

The neural implant of the future also could strengthen neural pathways associated with physical tasks. It could recognize "practice" movements and deliver stimulation to associated neurons to help your brain learn faster. Initial users would be people learning to walk again after having a stroke. But you could just as easily be swinging a tennis racket or a baseball bat. Or hitting perfect jump shots. With help from a neural

implant, it might be possible for athletes to hone their skills incredibly quickly.

The next generation of assistive technology is making headlines every week. The journal *Nature* recently reported on two paralyzed individuals who were able to command a robotic arm to make reach-and-grasp movements by thought, using only a Braingate neural implant. One woman had enough dexterity to pick up a cup and take a sip of coffee through a straw. In Boston, a blind man recently visited the Massachusetts Eye and Ear Infirmary and had a lens wired directly to his optic nerve. He is now able to see colors and read large print text. And last month, a woman paralyzed from the waist down walked the London Marathon in 17 days, wearing a ReWalk motorized exoskeleton.

The technology can give us brains and brawn. All we have to do is let the devices under our skin. So who will reap the benefits? At first glance, this appears to be just another advantage waiting for the wealthy. Maybe, but the early adopters will be those with disabilities. Not because they have money but because they have a lot to gain and are willing to face the risks inherent in new medical technology. Alleviating chronic seizures or debilitating tremors isn't some kind of greedy leg up for a person with a serious disability—it may mean the difference between life and death. But once the people with serious disorders are treated, where will the technology go next? The Census Bureau estimates that about 13% of the population in the U.S. is over the age of 65. That is roughly 40 million people who have lost physical and mental capacity through the natural aging process. Regardless of their resources, they will be keen to regain their powers.

The dissemination of advanced implantable technology will likely be just as ruthlessly democratic as the ailments it is destined to treat. Meaning that, someday soon, we may have a new class of very smart, very fast people—yesterday's disabled and elderly.

The sudden appearance of "super-abled" people could put new and unforeseen strains on our society. For example, what happens when mentally sharp, physically capable retirees return to the workforce by the millions? When your child is the only kid in her class without an implant and she has the lowest test scores to prove it, will you agree to put her under the knife? Will professional sports teams let superabled people play,

or is that cheating? Would you hire one over a "regular" person? Should a person be required to reveal the presence of an implant? Or will that just open the door for discrimination?

Humanity has been co-evolving with technology for more than 100,000 years. Together with our tools, we are on a grand, generation-spanning trajectory. Whether we like it or not, the next step of this evolution is on the near horizon.

*Daniel H. Wilson is a New York Times best selling author, [television host](#) and [robotics engineer](#). He currently resides in [Portland, Oregon](#). His most recent novel, published on June 7, 2011, is [Robocalypse](#).*

*Dr. Wilson's novel, "Amped," will be published by Doubleday on June 5.*