

ity of life" depend on it. So does the United States' position as a global power.

The new chief executive should start early, says Mooney. A distinguished science adviser should be selected and standing on the Capitol steps with the vice president and congressional leaders during the inauguration. A strong director of the National Institutes of Health should be appointed promptly, along with a competent commissioner of the Food and Drug Administration. The message of the new administration, Republican or Democratic, should be: Science matters.

## SCIENCE &amp; TECHNOLOGY

## Brainpower and Bankruptcy

**THE SOURCE:** "Do You Have to Be Smart to Be Rich? The Impact of IQ on Wealth, Income, and Financial Distress" by Jay L. Zagorsky, in *Intelligence*, Sept.–Oct. 2007.

IT'S NOT NECESSARY TO BE smart to be rich, but it sure helps. Every additional IQ point correlates with an additional \$234 to \$616 a year in income among younger baby boomers, writes Jay L. Zagorsky, a research scientist at Ohio State University. But brains don't necessarily protect people from financial distress.

People with IQ scores slightly higher than the average (100) are least likely to live beyond their means. Within both the

People with higher IQs have more than their share of financial woes.

below-average and above-average intelligence groups, however, the likelihood of financial distress generally rises with IQ scores.

Geniuses and near-geniuses—those with scores of 140 and above—are the most likely of all IQ groups to max out one or more credit cards and to miss payments or be more than two months late. They're less likely to declare bankruptcy than the average person, though 14 percent of them do succumb.

Intelligence alone doesn't explain why individuals succeed or fail in economic life. Behavior matters. For every additional year a person can grind out in school (beyond a certain point), the reward is more than \$2,200 in net worth. Divorce slashes worth by more than \$28,000. The real explanation for economic success may well rest on psychological factors, such as a person's desire

### IQs and Finances

IQ score	Maxed credit card (%)	Missed payment (%)	Declared bankruptcy (%)
70	2.6	7.6	7.9
80	7.6	14.2	15.2
90	10.0	17.9	20.0
100	8.3	17.6	20.7
110	5.8	15.5	18.5
120	4.6	13.8	15.7
130	5.7	14.1	13.9
140	14.2	18.8	14.1

In a comparison among 40-year-olds making \$45,000, higher IQs often meant more financial problems.

for immediate satisfaction, tolerance of risk, or ability to reject social influence, Zagorsky says. And don't discount luck, timing, and parents.

## SCIENCE &amp; TECHNOLOGY

## The Undersea Frontier

**THE SOURCE:** "The Last Great Landgrab" by Geoffrey Gagnon, in *Wired*, Feb. 2008.

FOR YEARS, RUSSIAN SHIPS have been plying the Arctic Ocean in search of irrefutable proof that the undersea Lomonosov Ridge is connected to the fatherland. When a robotic arm pounded a titanium tricolor into the seabed under the North Pole in August, Russian explorers announced success. Unfortunately, both Canada and Denmark already claim this spot on the ocean bottom as their own.

The world's coastal nations are scrambling to stake out territory on the last international frontier—the shelves and mountain ranges that stretch hundreds of miles from their shores. Touched off by an obscure authorizing provision in the United Nations Law of the Sea Treaty, the breakup of polar ice that makes undersea mining feasible, and—not incidentally—the high price of oil, the last great land rush is under way, says Geoffrey Gagnon, a magazine editor and writer. Some specialists believe the Arctic contains more oil than Saudi Arabia.

For centuries, the Cannon Shot Rule limited a nation's territorial

ambitions to roughly three miles, the range of a 17th-century cannon. In 1945, President Harry S. Truman unilaterally extended U.S. boundaries about 200 miles, to the edge of the continental shelf, in order to lay claim to offshore oil. But when other countries followed suit, confusion arose over the exact extent of each nation's shelf. Four decades later, the Law of the Sea Treaty allowed a nation to go beyond 200 miles by submitting evidence that its continental shelf extended past that limit. The treaty, minus America's signature, took effect in 1994.

Quietly, the University of New Hampshire's Center for Coastal and Ocean Mapping has been surveying U.S. coastal waters to arm American diplomats with evidence to claim additional territory if the Senate ratifies the treaty, as President George W. Bush has asked. This could allow the nation to grow by at least 386,000 square miles. Alaska's maritime boundaries would be pushed out 150 miles, and in the south, U.S. claims would reach to the middle of the Gulf of Mexico. The oil, gas, and other resources contained in the new U.S. territory could be worth at least \$1.3 trillion, Gagnon says.

It's tricky business delineating the rock of the continental shelf from the stone of the sea floor. For six years, U.S. marine geologists have been meticulously traversing the seas, in a back-and-forth movement like "mowing a lawn," mapping the floors of the underwater Arctic Ocean, the Bering Sea, the Pacific waters surrounding the Mariana Islands, the gulfs of Alaska and Mexico, and the Atlantic Margin off the East Coast. Nine coun-

tries have already filed claims to expand their undersea turf. But if dozens of countries try to "grow" simultaneously, many of them are going to be wrangling over the same rocks. Already Britain, Argentina, and Chile claim the same stretches of ocean floor—off Antarctica.

## SCIENCE &amp; TECHNOLOGY

## Biofuel Backfire

**THE SOURCE:** "Land Clearing and the Biofuel Carbon Debt" by Joseph Fargione, Jason Hill, David Tilman, Stephen Polasky, and Peter Hawthorne, in *Scienceexpress*, Feb. 7, 2008.

THE PROSPECT OF PAINLESSLY growing corn and sugar cane on spare land to reduce global warming always seemed too good to be true. And so it is, write Joseph Fargione of the Nature Conservancy and four coauthors from the University of Minnesota. Switching from oil to biofuels might actually make things worse.

The problem arises because plowing up large tracts of undisturbed land to plant biofuels could release vast amounts of carbon dioxide (CO<sub>2</sub>)—between 17 to 420 times more CO<sub>2</sub>—than the fossil fuels that are replaced.

New agricultural production

Plowing up undisturbed lands to plant biofuel crops could release far more carbon dioxide than simply burning fossil fuels.

generates a "carbon debt" by releasing long-sequestered CO<sub>2</sub> into the atmosphere as land is cleared—often by burning—and plants decompose. If, as is done in Malaysia, peat soil is drained to make way for palm tree plantations (palm oil is a source of biodiesel), environmental damage becomes even more severe because peat releases great amounts of CO<sub>2</sub> as it dries out. The "carbon debt" run up by growing corn on fallow midwestern grasslands to produce ethanol would take about 93 years to erase. The debt incurred by transforming tropical peatland into palm plantations would last for 840 years, Fargione and his coauthors estimate.

As America tries to wean itself from foreign oil, the newly enacted Energy Independence and Security Act mandates the use of more ethanol and other such products. Environmentally friendly biofuels might eventually be derived from perennial grasses and woody plants grown on degraded and abandoned agricultural lands that would remain unplowed. The byproducts of sustainable forestry and the stalks and leaves of corn and soybean plants are also promising sources of biofuels. (Other specialists note, however, that the needed processing technology is not fully developed.)

Biofuel crops could someday reduce reliance on oil from the unstable Middle East. But they also might have the disadvantage of raising grocery prices and shifting food crops to more ecologically vulnerable locales. The authors' conclusions are clear: Biofuels are no panacea.