

Technology AN MIT ENTERPRISE Review

Freeman Dyson
at War, 1943 p62

Repairing Broken
Genes p40

MIT NEWS

The Class of
1956 pM12



Will This Save the World?

The \$100 Laptop

BY JAMES SUROWIECKI Page 48

**The world consumes two barrels
of oil for every barrel discovered.**

So is this something you should be worried about?



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The world consumes 84 million barrels of oil a day.



By 2030 the number of cars in the world will increase by 50%.

World Energy Demand

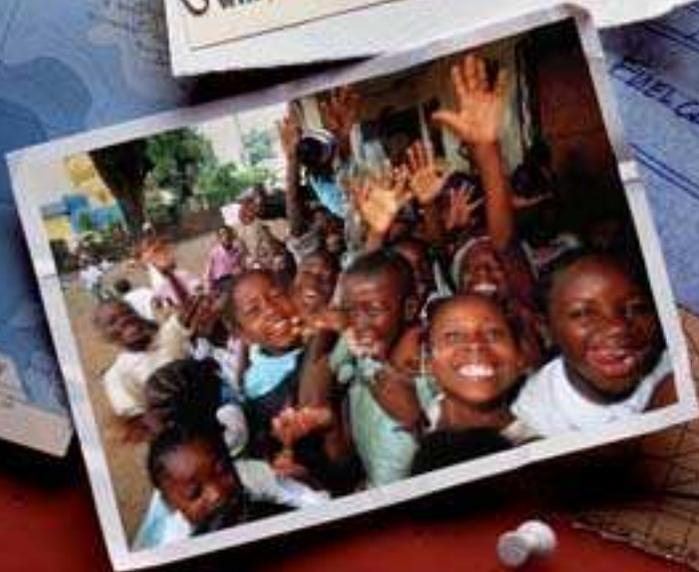


The fact is, the world has been finding less oil than it's been using for twenty years now. Not only has demand been soaring, but the oil we've been finding is coming from places that are tough to reach. At the same time, more of this newly discovered oil is of the type that requires a greater investment to refine. And because demand for this precious resource will grow, according to some, by over 40% by 2025, fueling the world's growing economic prosperity will take a lot more energy from every possible source.

The energy industry needs to get more from existing fields while continuing to search for new reserves. Automakers must continue to improve fuel efficiency and perfect hybrid vehicles. Technological improvements are needed so that wind, solar and hydrogen can be more viable parts of the energy equation. Governments need to create energy policies that promote economically and environmentally sound development. Consumers must demand, and be willing to pay for, some of these solutions, while practicing conservation efforts of their own.

Inaction is not an option. But if everyone works together, we can balance this equation. We're taking some of the steps needed to get started, but we need your help to get the rest of the way.

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- In 2004, achieved exploration record 78% higher than 10-year industry average
- Using steamflooding to extract heavy oil that was previously unrecoverable - more than 1.3 billion barrels from one field alone



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Contents

Volume 109, Number 5



Cover photo by Christopher Harting

- 4 **Contributors**
- 8 **Letters**
- 10 **From the Editor**
- Forward**
- 19 **Cell Burst**
How ultrasound slips drugs into cells
- 20 **Window Power**
Energy-generating building material is in production
- 21 **The Value of Spam**
Stock-touting e-mail is lucrative.
- 21 **Congestion Control**
Creative tolls could reduce urban traffic.
- 22 **BMW's Hydrogen Engine**
The company has a low-polluting, 260-horsepower prototype.
- 22 **Self-Cooling Microchips**
Silicon ion pump creates a breeze
- 23 **Patent Objector**
Legal battles over broad patents on stem cells and software
- 23 **Annotating the Earth**
Google Earth goes deeper.
- 24 **55,000 Tiny Pens**
Nanoscale protein printouts could speed drug discovery.
- 24 **On Autism's Trail**
Affymetrix's microarrays will provide insight into complex genetic diseases. *And more ...*

Features

- 40 **The Glimmering Promise of Gene Therapy**
Despite past failures, gene therapy still holds the promise of cures for some of the most horrendous human diseases. **By Horace Freeland Judson**
- 48 **COVER STORY Philanthropy's New Prototype**
Can Nicholas Negroponte, the Andrew Carnegie of the information age, get governments to buy cheap laptops? **By James Surowiecki**
- 58 **Silicon and Sun**
Daniel Morse has found an unusual inspiration for cheaper, more efficient solar cells: sea sponges. **By Kevin Bullis**
- 62 **Essay: A Failure of Intelligence**
A personal account of operational research at the British Royal Air Force Bomber Command, 1943–1945. **By Freeman Dyson**

Hack

- 26 **How to Steal an Election**
Researchers at Princeton hack a Diebold voting machine.
By Daniel Turner

Q&A

- 28 **Danny Hillis**
Why is creating thinking machines so difficult?
By Jason Pontin

Notebooks

- 30 **Computer Lesson**
Introducing computers to schools in poor countries requires care.
By Simeon Simeonov
- 30 **Optical Signal Processing**
Photonic crystals could finally make it a reality.
By Marin Soljačić
- 32 **The Prize of RNAi**
The study of small RNAs could mean new drugs and new understanding.
By Phillip Sharp

Photo Essay

- 34 **Hungry Monkeys**
Monkeys on an extremely low-calorie diet are healthier—and hungrier.
By Katherine Bourzac

Reviews

- 72 **Fakesters**
On MySpace, you can be friends with Burger King. This is social networking?
By Wade Roush
- 74 **Spying On My Wife**
Surveillance gizmos are a part of my life. What do they reveal?
By Simson Garfinkel
- 76 **Waiting for Personalized Medicine**
Pharmacogenomics promises drugs tailored to your genetic profile—but just try getting one of the tests.
By Emily Singer

Demo

- 78 **Finding Hidden Tumors**
Doctors at Massachusetts General Hospital are using whole-body MRI to illuminate a tricky disease.
By Katherine Bourzac

From the Labs

- 82 **Biotechnology**
- 84 **Information Technology**
- 86 **Nanotechnology**

23 Years Ago in TR

- 88 **Gene Therapy: Proceed with Caution**
By Katherine Bourzac



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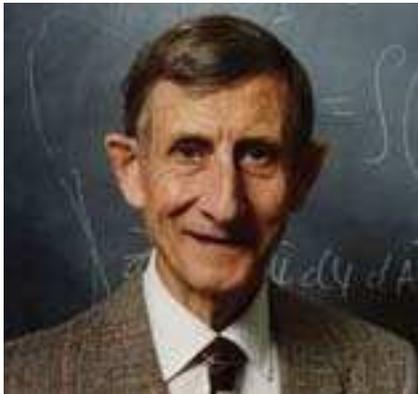
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Contributors



Freeman Dyson wrote the first of what will become regular features in this magazine: essays. In “A Failure of Intelligence” (p. 62), Dyson recalls the time he spent, beginning at age 19, developing analytical methods to help the British Royal Air Force more safely and effectively bomb German targets. “Now that we are engaged in an unpopular and badly mismanaged war,” he says, “people have a tendency to look back on World War II with nostalgia as a ‘Good War,’ fought with a clear moral purpose and competent management. Since I belong to the dwindling group of survivors with personal experience of World War II, I wrote this piece to give the younger generation a glimpse of that war as I saw it. From my viewpoint at the headquarters of Royal Air Force Bomber Command, the war was a meat grinder, slaughtering German civilians and British airmen with equal mindlessness, paying little attention either to moral principles or to strategic needs. In that war as in the present one, secrecy was used to conceal our failures and mistakes, not so much from our enemies as from our own citizens.” Dyson was for many years professor of physics at the Institute for Advanced Study in Princeton, NJ. He is famous for his work in mathematical physics and as an author of books for the general public, including his classic intellectual autobiography, *Disturbing the Universe*.

James Surowiecki wrote this issue’s cover story (p. 48), which explores the work of Nicholas Negroponte and his philanthropic organization One Laptop per Child. Negroponte, Surowiecki argues, has done more than build the now fabled \$100 laptop: he has also created a philanthropic organization



that might do for the early 21st century what Andrew Carnegie’s push for public libraries did for the early 20th. “At least to my mind,” he says, “philanthropy and charity used to feel like pretty sleepy topics. But I think today, the nonprofit sector really has become home to some of the most interesting and innovative thinking about everything from education to health care to development, and the \$100-laptop project epitomizes that shift.” Surowiecki is the financial columnist at the *New Yorker* and the author of *The Wisdom of Crowds*.



Horace Freeland Judson writes in this issue about the current state of gene therapy (“*The Glimmering Promise of Gene Therapy*,” p. 40), a field whose false starts and dashed hopes he has been watching for much of his career. “I have been tracking recombinant DNA and the hopes for gene therapy for more than a third of a

century,” he says, “with an archive of interviews of almost archeological proportions, going back as early as 1970.” Judson has held academic appointments at Johns Hopkins and Stanford Universities, and he founded George Washington University’s Center for History of Recent Science. He is the author of *The Eighth Day of Creation*, a history of molecular biology whose first three chapters appeared in the *New Yorker* in 1978. He recently signed a contract for a book that will expand on the story he tells here.

Wade Roush wrote the review in this issue of MySpace (p. 72), the world’s most populous and possibly most marketing-ridden social-networking website. “I’ve been covering the culture and technology of social computing for a few years now, including the social-networking sites, but I’d never written about MySpace,” he says. “It’s the elephant in the room that the inventors of social networking would rather disown, and I understand why.



It’s garish and chaotic. But more than that, the site pushes members to define themselves in terms of the songs, videos, and products they’re consuming, rather than as individuals with unique interests. It’s a giant incubator for viral marketing, with members as the vectors.” Roush earned a PhD in the history of technology from MIT in 1994. He recently moved from San Francisco, where he spent five years as senior editor and West Coast bureau chief for *Technology Review*, to Las Vegas, where he has taken up a freelance career.



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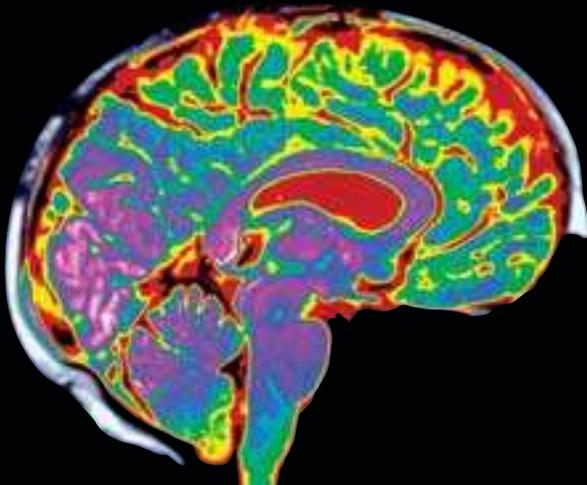
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Letters

Our September/October 2006 issue featured our annual presentation of the TR35, our list of 35 noteworthy innovators under the age of 35.

The TR35

Matthew Herren's vision of enabling educational opportunities for young Africans is to be applauded for focusing on the most disenfranchised people in the world ("*TR35: Young Innovators with This Year's Best Ideas*," September/October 2006).

I believe there is a blind spot in Mr. Herren's vision, however. He argues that many paper-based educational materials are far beyond the means of many poor families, and that the solution to this problem is to switch from paper-based media to electroni-

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cally based media—and yet he doesn't say how such a switch would reduce costs. Electronic delivery mechanisms require power, via battery or dedicated electrical-transmission lines. I can state from experience that the overwhelming majority of Africans have no access to electricity and could not power their electronic learning-delivery devices even if they could afford them.

I applaud Mr. Herren's vision, but I think he may have more obstacles in his path than he might anticipate. Nonetheless, as your magazine so eloquently points out, true innovators are not discouraged by obstacles, and I sincerely wish Mr. Herren success in his pursuit.

*Jim Lewis
Bel Air, MD*

TR35 member Michael Raab's bio-engineering approach toward economical ethanol production, which centers on infusing corn with enzymes that will allow more of the plant to be converted into ethanol, needs the following modifications: transfer this

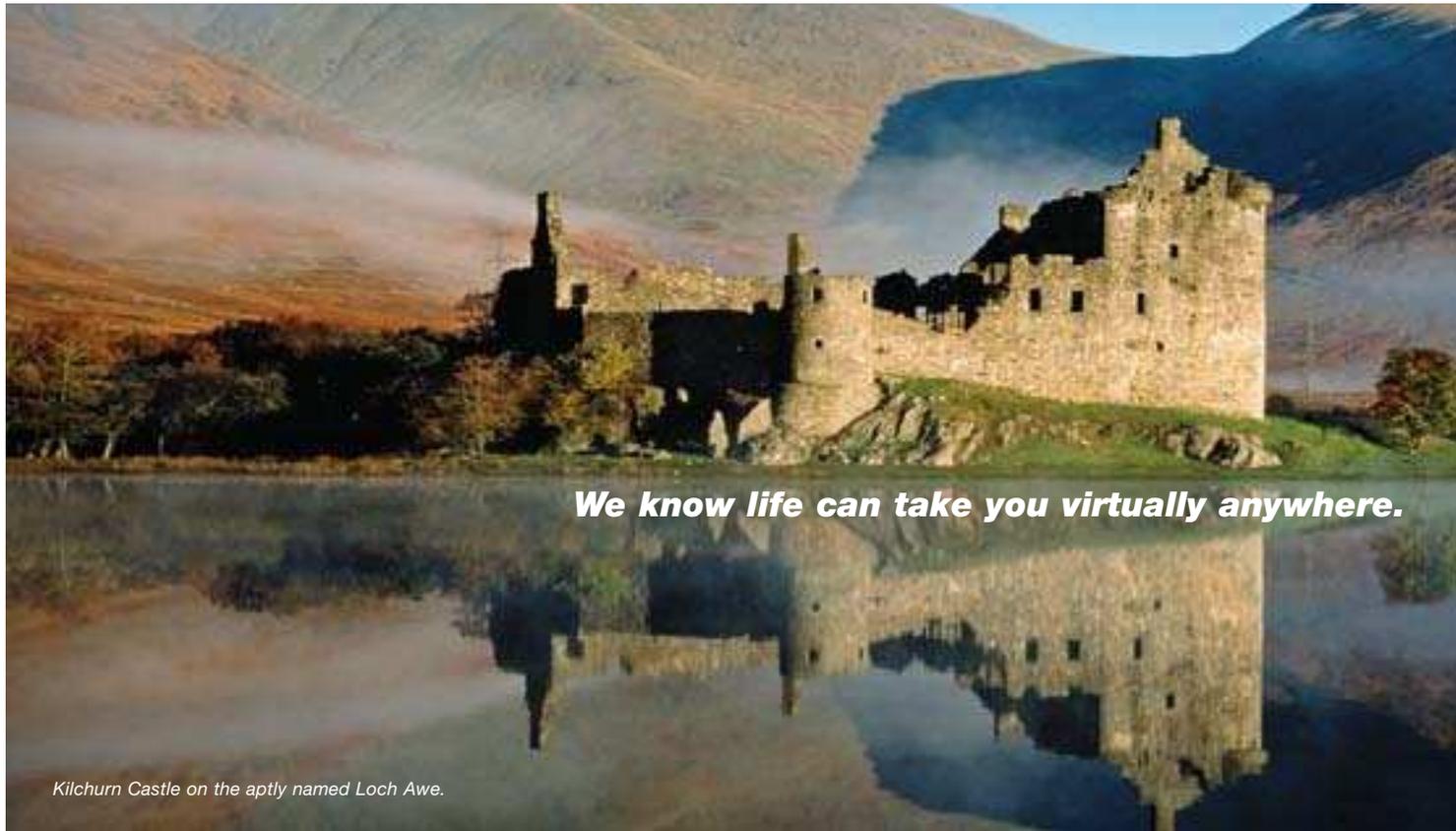
work to common lawn grass, and politically mandate the periodic gathering of the clippings for ethanol production. Using every homeowner as a source for agricultural production would free up our croplands for more vital uses!

*Thomas S. Stein
Neehah, WI*

In reading your roundup of this year's TR35, I noticed a lot of very interesting things in the area of neurology. However, I was disturbed that so many of the experiments you described used mice. Mice experience fear and suffer pain and death in the laboratory, and yet you never question whether it is ethical to use them. I won't claim to know the right answer, but I do know that scientists must always question the ethics of their methods. If pursuing knowledge harms others, it is not acceptable to do it just because one can. I hope in the future you at least discuss the ethics of the means your TR35 use.

*Eric Walden
Lubbock, TX*

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