

## SCIENCE &amp; TECHNOLOGY

# Against Biologism

**THE SOURCE:** "Neurotrash" by Raymond Tallis, in *Prospect*, June 2011.

IF YOU SUBSCRIBE TO THE WILSON *Quarterly*, you are probably fond of reading. Where do you think that predilection comes from? A neural circuitry over which you have little control, or an amalgam of factors, including education and parental encouragement?

If you're in the latter camp, you have an ally in Raymond Tallis, a retired physician and clinical scientist in the United Kingdom who staunchly opposes biological determinism, or biologism. Biologism's governing idea is that humans are "organisms rather than people," acting only out of innate drives. Adherents hold that human experience "is identical with activity in the brain." All of this is hogwash, Tallis says. It's true that some experiences roughly correlate with activity in certain parts of the brain. But there's no saying that this is the *only* mechanism at play in human experience. Memory, for instance, has no specific way of being represented by brain activity. And biologism cannot account for what philosophers call "intentionality"—an awareness unique to humans of the otherness of the world around them. Human consciousness is so rich and multi-

faceted that it's "a much tougher nut to crack than the mystery of the Trinity," Tallis argues.

That's not the only complaint he has with those who think that human experience can be wholly explained by the brain's electrical impulses. They also strive too hard to see human behavior through an evolutionary lens, grasping for Darwinian explanations of artistic, religious, and ethical practices, he believes. Some speak of "memes"—cultural analogues to genes—that spread throughout society, rising and falling on their evolutionary usefulness. But humans are not just "pieces of living matter subject to the laws of the biosphere," Tallis protests. Our cousins in the animal kingdom might be governed by unconscious biological imperatives, but people lead lives, "regulating them by shared and individual narratives."

People who look exclusively to the brain for answers to life's great mysteries are barking up the wrong tree, Tallis concludes.

Humans are not organisms simply acting out innate drives. Capabilities such as memory and intention make us an animal apart.

"Our bodies are generated by natural processes, and . . . eventually the natural world closes over us. But between birth and death we inhabit a community of minds, a human world that goes beyond nature," he writes.

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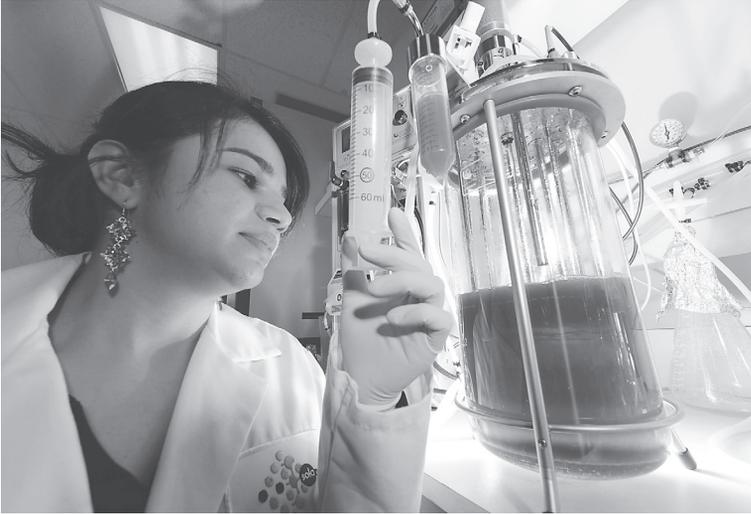
## Energy From Algae?

**THE SOURCE:** "The Scum Solution" by Neil Savage, in *Nature*, June 23, 2011.

THE ENDLESS QUEST FOR AN alternative to petroleum has dipped a toe in a rather slimy source: pond scum, reports science journalist Neil Savage.

There's plenty to like about the green- and red-colored organisms as a possible fuel source. Unlike many biofuel sources, such as corn and sugar cane, which require land that could be used to grow food, algae can easily grow in areas not suitable for farming as long as water is supplied. Algae even do well in polluted water. They are also incredibly productive: Researchers estimate that algae could produce 61,000 liters (around 16,110 gallons) of biofuel per hectare; by comparison, soybeans only yield 200 to 450 liters.

Lots of problems must be resolved before algae-based biofuels become more than a novelty. For one thing, because algae need sunlight, the surface area required to cultivate meaningful amounts is tremendous. Europe



**Sizing up scum:** Researchers are experimenting with new technologies to harvest biofuel from algae.

would need an algae farm the size of Portugal to produce enough fuel to fully supply just its transportation systems. And the water requirements of algae farms are immense, dwarfing those of more traditional forms of agriculture. Combined with a slow and delicate harvesting process, in which algae cells are broken apart to extract oil that can be turned into

fuel, these factors make current algae biofuels too financially and environmentally expensive to compete.

Some scientists say that the algae cultivation process can be tweaked to overcome current production difficulties. One renewable energy company in San Francisco has engineered a way to overcome the inefficiencies of

photosynthesis that hamper algae's production of fuel-packed oil. Another company believes that the future lies with blue-green algae (which are actually photosynthetic bacteria) that naturally secrete oil and thus don't need to be destroyed in the harvesting process.

Proponents of algae biofuels insist that algae's depths have yet to be plumbed. Photosynthesis converts barely more than one percent of the sunlight reaching the Earth into chemical energy that humans can use, but a share closer to 10 percent is possible.

Both the government and the private sector are listening: The U.S. Department of Energy recently granted a research consortium \$44 million to develop algae energy technology, and companies such as ExxonMobil and Boeing have devoted funds to similar research. Algae may be mucky, but they have the potential to be as good as gold.

## EXCERPT

### Burning Brightly

*After the energy shocks of the 1970s, high-pressure sodium lights gradually took over the night. Following the economic imperative to use the most cost-effective lighting—high-pressure sodium lights consume half as much energy as mercury-vapor lamps and can last up to 16,000 hours longer—transportation departments and cities embraced sodium light. It was as though someone said Fiat lux sulfurea—“Let there be light from hell.” The relentless spread of sodium streetlights is documented in NASA night photographs from space: New York City*

*and Los Angeles are circuit boards of glowing orange, and Long Beach [California], one of the world's busiest ports, is a flare of tarnished gold. . . .*

*The color of night is changing again. In the next decade, a large percentage of America's 37 million streetlights will be equipped with light-emitting diodes, or LEDs, and other kinds of solid-state lighting. Once again, energy saving is the driving force. . . . Unlike sodium lights, LEDs and other next-generation lights can be tuned to various colors, easily dimmed, arranged into luminous surfaces and shapes, and turned on and off instantly. . . . Perhaps we can now learn, in the words of the lighting designer Rogier van der Heide, “why light needs darkness.”*

—**HAL ESPEN**, a writer in Santa Fe, New Mexico, in *The Atlantic* (July–Aug. 2011)