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The Monster from . . . Waltham

Robots who can create robots? That's right.

By John Farrell, writer and video producer----------ofearghail@yahoo.com

While the rest of the world ponders the potentially eerie implications of the news in yesterday's *New York Times* that robots can be designed to create their own robots, those of us living around the vaunted technology highway in Massachusetts can only scratch our heads.

They did this in Waltham?

Waltham, the little town where Brandeis University lies, is not exactly the place one expects Dr. Frankenstein to come from (although on certain autumn days lonelier parts of the town do attain a Hammer Film style atmosphere).

And indeed, as the *Times* feature makes clear, the Brandeis computer scientists responsible for creating these creative little robots hardly think there's anything to get worried about...yet.

"Really, it's so far removed from anything dangerous," said Dr. Hod Lipson. His robot produces eight-inch-long contraptions of plastic bars and ball joints. The robot then adds a microchip and a motor so that the contraptions it creates can crawl by themselves. "They look like toys," according to his colleague, Dr. Jordan B. Pollack. The team has prepared a report of their robots for the most recent issue of *Nature*.

According to Dr. Philip Husbands, an artificial intelligence specialist at the University of Sussex in England, "This is the first example of pretty much 100 percent automated evolution of a machine. It's a rather primitive example, but it's the first step to something that could be quite significant."

But not everyone in the scientific world is enthusiastic about the creation of "artifical life." Bill Joy, the chief scientist at Sun Microsystems, plainly thinks we're now on the Hellish road to mating the *Terminator* and the *Matrix*, where self-replicating machines will overthrow humans and turn the world into a giant erector set.

In *Wired*'s April issue, he argued that scientists should stay away from research in creating self-replicating, evolving, autonomous robots. In a rather confused statement, he told the *Times* reporter, "We're on the road to somewhere where there's big issues down the road." (Is it possible to be on the same road twice? Or does he mean another road off this one?)

But Dr. Lipson is right. It's hard to be terrified of what looks at first glance like one of those thick plastic coat hangers you can get in batches at the local Kmart. According to Dr. Pollack, the experiment began with their robotic manufacturing system — a computer linked to a machine which builds plastic models. It was given a list of possible parts to work with, input on the laws of gravity and friction, the goal of moving on a horizontal surface and 200 randomly constructed, nonworking designs.

The computer then started out adding, subtracting, and changing pieces on its creation, running simulations to test the design, keeping the designs that moved well and discarding the ones that didn't. Evolution applied to machines, in other words. The computer ran between 300 and 600 generations of evolving and fine-tuning the design before sending it to the prototyping machine to build the robot. The only step that required human help came at this stage, when the researchers installed the robot's motor and microchip and downloaded the programming instructions. Then the critter went to work on its own.

One product pushed itself along like an accordion, according to Pollack. Another, "walks something like a crab," said Lipson. As computer chips accelerate and the self-replicating machines become more elaborate, designing robots will produce their own robots that are increasingly complex.

Future designs might also be able to communicate with other robots and learn from each other's experiences.

From a practical point of view, such robots could be used to design robots that help in factories, clean up polluted lakes and rivers, or vacuum a home. (Ray Bradbury was way ahead of everyone here, with a story he wrote in the 1950s in which robot mice scurry all over the house licking up dust.) Eventually they may help considerably in the dangerous (or tedious) exploration of interstellar space.

This doesn't sound ominous — unless perhaps you think of what liberals could do with this technology.

For example: They could design robots that multiply and sneak into the tail

pipes of hapless drivers whose cars aren't up to environmental air standards — and report on them. Smart robots could make life hell for smokers who light up in office and airplane bathrooms. (*Invasion of the Cigarette Snatchers*, coming soon.) They could hide out in remote ponds and rivers and snapshot suspected big-business types in the act of illegal toxic-waste dumping.

And what about those hapless rabbis and preachers who utter a prayer at some small town public high school graduation — when the Bible in their hands turns out to be a self-replicating Palm Pilot from Hell, logging their every move for a wireless report to the local chapter of the ACLU?

Al Gore's probably working this stuff into his stump speeches right now.

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