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Ineffective disinfection has substantial consequences. Blood culture contamination after venepuncture is relatively common and may lead to false positive cultures and unnecessary antibiotic use and hospital stays (3). Furthermore, bacteria can be introduced in the bloodstream, causing local or systemic infection. Among the bacteria detected in this body region by Grice *et al.* were the *Staphylococcus aureus* species and phyla hosting pathogens that are responsible for the most common causes of bloodstream infection and sepsis (4).

The findings in this report provide grounds for more meticulous disinfection, at least until trials offer us more definitive evidence.

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## Make Way for Robot Scientists

IN THEIR 19 JUNE LETTER (“MACHINES FALL short of revolutionary science,” p. 1515), P. W. Anderson and E. Abrahams, commenting on our work on the automation of science, state that we are “seriously mistaken about the nature of the scientific enterprise.” Their argument seems to be based on two premises: (i) There are two types of science, normal and revolutionary, and normal science “does not contribute very much to the advancement of knowledge.” This view dismisses as unimportant the vast bulk of science, and must surely be wrong. (ii) Whereas normal science may be automated, revolutionary science never will be, as there is no possible “mechanism.” It is certainly true that revolutionary science cannot currently be automated, and in our Report

(“The automation of science,” 3 April, p. 85) we described the automatically generated science as “modest...but not trivial.” Nevertheless, the inability of some critics to imagine a mechanism does not eliminate the possibility that one exists.

Indeed, the mechanism we propose is the one that has been successfully applied to chess: There is a continuum in player skill, and computers slowly improved with advances in computer hardware and software until they now play at world championship level. We argue that there is a similar continuum in the ability to do science, from what robot scientists can do today, through what most human scientists can achieve, up to the level of a Darwin or Newton.

## LIFE IN SCIENCE

### Creationists Made Me Do It

I was always a mediocre student, especially in high school. I never really knew what I wanted to do, and nothing seemed to excite me. This changed in my senior year, when a creationist visited my biology class.

On that fateful day, all the science students were herded into the school auditorium, where we listened to a long and richly illustrated lecture describing literal creationism. We were informed that in an effort to “balance” our education, we would soon hear an equally long lecture on evolution. This, like many things I heard that day, turned out to be false. The evolution lecture never materialized. Remarkably, I graduated from senior biology having learned only about creationism.

School had finally gotten my full attention. I wanted to know what we were missing, and why. For the first time in my life, I willingly (eagerly even) picked up my textbook and studiously read it. With growing interest, I realized that evolution made an awful lot of sense, and that I was being hoodwinked by my biology class.

It’s hard to overestimate the appeal of rebelling against the system to a teenaged boy, and that day marked the beginning of my path to a career in evolutionary biology. We learned other things

in science class that year, too—for example, that all actions have an opposite reaction. For at least one sulky teenager in the small town of Owen Sound, Ontario, it took a creationist to make him into an evolutionary biologist.

PATRICK J. KEELING

#### EDITOR’S NOTE

This is an occasional feature highlighting some of the day-to-day humorous realities that face our readers. Can you top this? Submit your best stories at [www.submit2science.org](http://www.submit2science.org).

Canadian Institute for Advanced Research, Botany Department, University of British Columbia, Vancouver, BC V6T 1Z4, Canada. E-mail: [pkeeling@interchange.ubc.ca](mailto:pkeeling@interchange.ubc.ca)

The Physics Nobel Laureate Frank Wilczek has said that the best chess player in the world is “non-human” and that this may well be true for the best physicist in 100 years time (1). Finally, Anderson and Abrahams ignore the possibility of machines and humans working together to do revolutionary science that neither could do alone.

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