SCIENCE NEWS®

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This Week

Research Notes

Articles

Cover: Hollywood cartoonists might make a more terrifying
animation of a scaled-up cockroach turned loose on a city. But
in this three-dimensional, computer-generated simulation, titled
"Grinning Evil Death," the insect's movements are controlled by
forces that follow the laws of Newtonian physics — not an artist's
pen. Scientists created the simulation to demonstrate the potential
of "virtual environments" for studying locomotion. (Image: David
Zeltzer, Michael McKenna, Bob Subiston, et al./Massachusetts
Institute of Technology Media Laboratory)

Departments

Letters

Passive failure

Every now and then, science — and espe-
cially mathematics — comes up with a revela-
tion so elegantly simple that it takes your
breath away. I hadn't realized the depth of
insight provided by number theory, as exem-
plified by the random-number generator
("Numbers at Random," SN: 11/9/91, p.300),
that "on the average, a high number is followed
by a lower one as often as a low number follows
a higher one."

Martin Graetz
Acton, Mass.

*Oops! The passive voice, against which our
editors regularly campaign, somehow slipped
into this crucial sentence, garbling its meaning.
The sentence should read: "For example, on the
average, a high number follows a lower one as
often as a low number follows a higher one."*
— I. Peterson

A world apart

While Thomas S. Ray has developed a clever
software environment, I don't see that he has
demonstrated evolution ("Electronic Ecosys-
tem," SN: 8/10/91, p.88).

Ray has made a number of simplifying
assumptions to guarantee that he will get most
of the effects he is looking for. He has created
his "organisms" out of a set of 32 distinct
instructions, all of which have an important
purpose. When mutations occur, the resulting
program is still a combination of those same
instructions and will continue to execute them
(albeit differently than before).

In this way the organisms of Tierra are made
to display the behaviors he calls parasitism,
hyperparasitism, etc. But none of the organ-
isms displays any capability that did not
preexist in the "genetic" pattern of the original
organism. In other words, none of the Tierran
organisms ever invented a new instruction for
itself that went fundamentally beyond the
capabilities of its parent organisms. All Ray

has demonstrated so far is genetic recombina-
tion, the so-called "microevolution" we see in
the world around us today.

Furthermore, when a mutation occurs in a
real-life organism, the mutated instructions do
not become another of the 32 useful instruc-
tions. Instead, they almost always become one
of the thousands of possible "noninstructions"
that result in weakness, instability and even
death. Almost never do you see a random
mutation that results in anything you might
call an improvement.

Next, Ray has contrived a number of rules
for his "universe" that exist for no other reason
than to keep his "evolutionary" machinery
operating. The "reaper" program, which pre-
vents organisms from overpopulating or grow-
ing too old, is one example, as is the "fountain
of youth," which arbitrarily blesses certain
organisms. These mechanisms build into the