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This Week

- 164 Global Crisis: The Fungi Stand Alone
- 164 Allergies to this soy would be nutty
- 165 Campus control of crystal growth in space
- 165 Survey finds gaps in kids' dental care
- 166 Hubble telescope reveals a patchy Pluto
- 166 Regrowing livers with gene therapy
- 167 Top projects capture Westinghouse awards
- 167 Drug may help to alleviate alcoholism

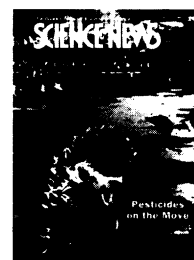
Research Notes

- 170 Environment
- 171 Biomedicine

Articles

- 168 A Cool View of the Heavens
- 174 The Pesticide Shuffle

Cover: Pesticides and other chemicals trek around the globe as a result of trade, dispersion, and incorporation into well-traveled wildlife—such as the albatrosses here on a remote Midway island. Foreground shows bird with deformed bill that may trace to the albatross' accumulation of pollutants. Without inventories of the production, sale, and use of pesticides, scientists and policy makers cannot adequately understand and limit the environmental threats posed by these compounds. (Photos: John Giesy/Michigan State University)



Departments

- 162 Books
- 163 Letters

Science Service, which publishes SCIENCE NEWS, is a nonprofit corporation founded in 1921. It gratefully accepts tax-deductible contributions and bequests to assist its efforts to increase the public understanding of science, with special emphasis on young people. More recently, it has included in its mission increasing scientific literacy among members of underrepresented groups. Through its Youth Programs it administers the International Science and Engineering Fair, the Science Talent Search for the Westinghouse Science Scholarships, and publishes and distributes the *Directory of Student Science Training Programs for Precollege Students*.

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Letters

Football-shaped bullets

In "Long pass: Pigskin in wobbly flight" (SN: 12/23&30/95, p. 442), you say, "It isn't completely clear why this effect would be important for a football but not for a missile or bullet."

It seems to me that the difference can be explained by considering the differences between the two.

The sides of the bullet fit flush against the inside of the rifle barrel, so there isn't any room for it to wobble. Perhaps if the bullet were football-shaped it, too, would wobble. The football is thrown manually. If a bullet-shaped missile weighed as much as a football and were the same size, I would expect it to behave like a football if it were thrown by a quarterback.

Emanuel Kelmenson
Jericho, N.Y.

Some 30 years ago, the Army began testing a "bobtail" bullet for pistols and rifles. The bullet had a tapered back end instead of the usual squared-off end. Because this tapering altered the way the bullet interacted with the air during its flight (specifically, the way it shed the vortices generated at its rear surface), it traveled much faster and farther for a given charge of powder.

This was highly desirable for the Army's purposes (to kill the enemy from a greater distance), but it was quickly discovered that the bullets wobbled about their axis and quickly departed from the desired trajectory—often in unpredictable ways. Because of the obvious safety hazard, the Army ceased development of these bullets.

Fifteen years or so later, the Army resurrected the bobtail idea for medium and heavy artillery shells. The results were the same—greater range but an almost total loss of control over target accuracy.

A similar problem led to the termination of

the XB-70 bomber aircraft program about 25 years ago. The XB-70 had a long fuselage with a delta-wing body set well behind the cockpit. In flight, the pilots reported an unexpected and nausea-producing motion. This instability was also a rotation about the axis of flight, with sudden transient excursions back to the flight axis.

It was discovered that at a certain airspeed, the instability caused loss of control. The bomber stalled, partially inverted, and crashed, killing the crew. No further testing of the unique design was ever conducted.

Clarence H. Annett
Shawnee Mission, Kan.

Tick picky?

Regarding the discovery of the "Oldest Lyme-carrying microbes found" (SN: 12/2/95, p. 373), it may be picky, but ticks are arachnids, not insects.

Jim Cheaney
Ames, Iowa