a 50% increase in funding for high-energy physics over the next decade, operation of the SSC would seem to consume all of the extrapolated annual budgets for high-energy research at universities ($100 million), Brookhaven National Laboratory ($90 million), Fermilab ($225 million), and the Stanford Linear Accelerator Center ($140 million). The net economic effect of funding the SSC is quite likely to be negative, in that money might be reduced in fields other than high-energy physics that have more consistently produced new and valuable spin-off technologies.

T. H. Geballe
Department of Applied Physics, Stanford University, Stanford, CA 94305
J. M. Rowell
Conductus, Inc., 969 West Maude Avenue, Sunnyvale, CA 94086

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Smitten by Quail

Long before the report by J. P. Dumbacher *et al.* "Homobatrachotoxin in the genus *Pitohui*: Chemical defense in birds?" (30 Oct., p. 799), there was mention of toxic birds in the Bible (Numbers 11:31–34). The citation describes quail carried into the Sinai Peninsula by "Winds from the sea" and gathered and eaten by the people of Israel. "While the flesh was yet between their teeth, ere it was chewed, the anger of the Lord was kindled against the people, and the Lord smote the people with a very great plague." Modern reports of toxic quail have been attributed to the neurotoxin coniine (*1*), which accumulates in the birds as a result of their eating hemlock during their migration from Africa to Europe.

The quail story suggests that toxins such as homobatrachotoxin may not be produced by animals themselves, but by exogenous sources such as microorganisms or by plants that are eaten by animals. This suggestion seems far more likely than the independent evolution of the same complex biosynthetic pathway in the two phylogenetically distant taxa that contain homobatrachotoxin, the pitohui bird and the poison-dart frog. Plants and microorganisms, which make a wide variety of chemicals (*2*), may be the source of homobatrachotoxin in these poisonous birds and frogs (or of precursors of the steroidal alkaloid that can be converted to the

toxin). Dumbacher *et al.* found the least amount of toxin in the stomach and stomach contents of the pitohuis, which makes the hypothesis of oral ingestion of the toxin somewhat less likely in these birds.

Microorganisms have been implicated as a source of exogenous toxin in pufferfish; cultured pufferfish do not produce tetrodotoxin until they are fed organs from wild fish (3), and several marine microorganisms able to produce tetrodotoxin have been isolated from wild fish (4).

David B. Berkowitz
Office of Biotechnology,
Food and Drug Administration,
Department of Health and
Human Services,
Rockville, MD 20857

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The Quality of Homoeosis

The Research News article "Gene research flowers in *Arabidopsis thaliana*" by Anne Simon Moffat (4 Dec., p. 1581) may have left readers with the misimpression that the *emf* mutation that my coworkers and I have isolated is in no sense "homoeotic." The *emf* mutant skips a step (the vegetative phase) in normal *Arabidopsis* development. The mutants can be considered homoeotic in the broad sense of the word, in that one body structure is replaced by another. However, in the narrow sense of homoeosis (one-for-one spatial replacement of structures), the *emf* mutant would not be classified as homoeotic because there is no change in position. Inflorescence meristem replaces vegetative meristem in the mutant. Both types of meristem occupy the shoot apical position, but at different times in development.

Because plant development takes place over the entire life cycle, temporal factors usually play a role in positional events. This means that, in plants, because of the confounding temporal factor, only the broad definition of homoeosis is applicable. We hypothesize in our report of 4 December (p. 1645) that the *EMF* gene acts as a developmental switch that simultaneously activates the vegetative and suppresses the reproductive state of the meristem and that, in the absence of *EMF*