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I am not so sure, as Messrs. Leigh and Ziegler maintain, that more than 150 million years ago there were no mutualistic associations between plants and animals analogous to the ones observed today. In late Pennsylvanian deposits (beginning about 298 million years ago), in which plant tissues are preserved in considerable anatomical detail, there is evidence for intricate associations. One example, from the Calhoun Flora of Illinois, is a seed fern that bears prepollen (a kind of microspore) far bigger than any known wind-dispersed pollen. The prepollen was produced in large organs

that were evidently pierced by a large piercing-and-sucking insect. Furthermore, fecal pellets in the same deposit contain the same or similar prepollen. Do such findings simply point to pollen eating, or was the insect providing a mutualistic benefit to the plant as well?

*Conrad C. Labandeira
Smithsonian Institution
Washington, D.C.*

ERRATUM: The caterpillar pictured on page 55 of "Biosphere III" (February 2003) should have been identified as belonging to the family Saturniidae, not Limacodidae.

Natural History's e-mail
address is nhmag@amnh.org.