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## Letters

### The missing link

In "Pinatubo's impact spreads around the globe" (SN: 8/31/91, p.132), Richard Monastersky writes, "Sulfur dioxide gas joins with water vapor in the atmosphere to form tiny droplets of sulfuric acid."

My chemistry courses left me with the impression that sulfur dioxide and water yielded sulfurous acid. Has elementary chemistry changed all that much, or did the article leave out some intermediate step whereby that extra oxygen got tacked on?

Donald Chandler  
Lincoln, Calif.

*Elementary chemistry has not changed. There are some intermediate steps in the pathway that converts sulfur dioxide to sulfuric acid in the atmosphere. First, sulfur dioxide (SO<sub>2</sub>) can react with OH to form HSO<sub>3</sub>. This molecule can go through several different reactions that yield SO<sub>3</sub>, which can then dissolve in water to form H<sub>2</sub>SO<sub>4</sub> (sulfuric acid), explains Fan Song-Miao, an*

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Cover: The cosmos takes on a different appearance in the infrared, and scientists have now developed a new breed of detectors to record these features. Consider the galaxy NGC 309. Viewed in visible light (inset), it has three spiral arms extending from a central disk. But a color-coded infrared image taken with a state-of-the-art detector depicts strikingly different characteristics: The galaxy appears to have only two spiral arms and an elongated center, suggesting it belongs to an entirely different galactic class than its visible-light portrait would indicate. (Images: David L. Block, Richard J. Wainscoat/NATURE)



### Departments

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*atmospheric chemist at Atmospheric and Environmental Research, Inc., in Cambridge, Mass.*  
— R. Monastersky

### Too high a price?

While it is interesting that monkeys separated from their mothers for the equivalent of two years may later drink alcohol excessively when exposed to it, I wonder if we did not pay too high a price for that information ("Motherless monkeys model alcohol abuse," SN: 8/17/91, p.102). It doesn't seem to lead anywhere. Do bad mothers trigger excessive alcohol intake, as absent mothers do? Do bad or absent fathers trigger excessive alcohol intake? If yes, and if this research is translatable to humans — which there is really no reason to assume — what then? Convince bad parents to be good because their children may become alcoholics? What exactly is the point of this work?

According to your article, no progress was made or intended in finding a genetic predisposition to alcoholism, and in any case this work already goes on with humans in a good

many places. And we already know that stress, along with many other factors, can lead to excessive alcohol intake.

All we know for sure from these experiments is that higher animals "vomited and staggered," "were put in individual cages where they could hear but not see their companions," and "became almost paralyzed with fear." This kind of work is very hard to defend once in the hands of animal activists.

Ingrid Eisenstadter  
New York, N.Y.

### CORRECTION



This illustration from "A reptile to reckon with" (SN: 11/9/91, p.303) shows how the extinct crocodilian *Purussaurus* would have dwarfed a 1.5-meter-long black bear. The caption was inadvertently omitted during production.

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