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## This Week



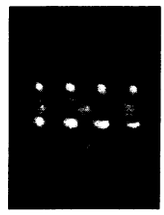
## Research Notes



## Articles



Cover: Raindrops can take on a variety of shapes depending on their size and whether they are oscillating. Small raindrops tend to be spherical; larger ones look like hamburger buns (green images). The large, pink shape in the background represents a gigantic, 8-millimeter drop. The four rows of blue and reddish figures show possible raindrop oscillation shapes. Research is now focusing on how these changing raindrop shapes affect radar measurements of rainfall rates. (Illustration: Kenneth V. Beard)





## Departments





# Letters

### Chaotic extortion

It was interesting to read in "The Chaos of War" (SN: 1/5/85, p. 13) that mathematical models for the onset of chaos have actually been applied to historical situations. Of particular interest is the conclusion by Prof. Saperstein that after the models become good approximations to actual national behavior, the policy would be to avoid areas of transition. Only a little reflection is necessary to see that such accurate models would bring a whole new dimension to the notion of international terrorism.

Let us suppose that countries A and B both have working state-of-the-art models for predicting the onset of chaos. Since the models are assumed to be accurate, the two systems will behave similarly. Country A then searches the solutions that force country B to enter the transition *unless* it makes certain concessions which it would not otherwise make. Country B can see the choice it is required to make, and it can also tell that it has been mandated by country A.

Question: In the case of this extortion will country B choose — as Saperstein tells us — to stay away from the transition, or will it choose instead to maintain its freedom of action, even if it means war? And, faced with the computer prediction of war, might it then decide that preemptive war is the best course?

Are accurate computer models of the stability/chaos transition stabilizing or destabilizing?

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### Intriguing questions

The article on Rampino and Stothers' research ("Comets and geological rhythms of the earth," SN: 1/12/85, p. 24), which demonstrates temporal correlation of rhythmic geological phenomena with periodic galactic events, implicitly asks several intriguing questions. In particular, I am interested in the very long periodicity (260 million years) reported for both impact cratering and various geological rhythms.

Rampino and Stothers pointed out that the briefer of the two periodicities reported (approximately 33 million years) correlates with the half-period of the solar system's oscillation perpendicular to the galactic plane, and a causal relationship was suggested. But it is fascinating to note that the longer 260 million year interval also correlates with a periodic galactic event — one elliptical orbit of the solar system about the galactic center. Even more compelling is the observation that this longer cycle agrees approximately in period and phase with perigalacticum — the orbital position nearest to the galactic center. Could perigalacticum also be related causally to frequency of cometary impacts? And if so, how?

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