

SCIENCE

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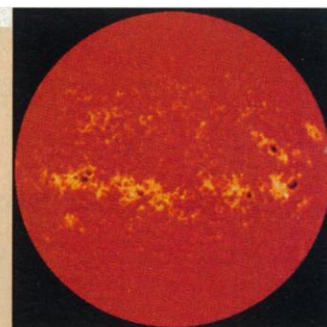
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LETTERS

Sources of heat

Changes in solar luminosity can affect climate, but another influence—human-produced greenhouse gases—is greater, says one writer. (At right, dark sunspots and bright faculae on the sun). Awarding a prize for the worst pseudoscience or antiscience TV program is proposed. The U.S. government's role in regulating new vaccines is criticized. The use of calculus as an applied tool (rather than as a theoretical discipline) brings one writer to an "epiphany." In a continuing debate, two scientists argue in favor of an international effort to construct a large-scale fusion reactor. Linus Pauling's valence bond theory is said to explain new structures in metal compounds. And Dr. Strange-love's deepest thoughts are remembered.



A. JOHANSSON AND W. MARQUETTE

Sun-Climate Links

Richard A. Kerr's article about sun-climate links (Research News, 8 Mar., p. 1360) gives short shrift to one important point. The infrared absorbing properties of the carbon dioxide (CO₂) molecule are fairly well known from spectroscopic theory and measurements. It is difficult to imagine feedbacks in the climate system that would render CO₂ heat-trapping effects negligible, while at the same time boosting the effects of smaller changes in absorbed solar energy.

The issue is less a question for "the most sophisticated computer models" than it is a matter of simple arithmetic (1). For example, Kerr's second figure shows total solar irradiance rising by a bit less than 4 watts per square meter during the last 450 years. Dividing by 4 ($4\pi r^2/\pi r^2$) to average over Earth's surface, and reducing by a further 30% to account for reflection to space, gives substantially less than 1 watt per square meter. This should be compared with more than 2 watts per square meter of infrared heat trapping resulting from human production of greenhouse gases to date (2).

It would be foolish to assume that historical solar luminosity changes are insignificant. We should not, however, make the opposite error and jump to the conclusion that they explain all—or even most—of the climate variations of the past few centuries.

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1. J. E. Hansen and A. A. Lacis, *Nature* **346**, 713 (1990).
2. *Climate Change: The 1995 IPCC Assessment* (in press).

And the Winner Is . . .

The article by Constance Holden about the program "The Mysterious Origins of Man" shown on the National Broadcasting Corporation's network (News & Comment, 8 Mar., p. 1357) discusses only the latest of a series of pseudoscience and antiscience programs to air on the broadcast television networks. Last year, another major network aired a program proposing that there was scientific evidence to support a literal account of Noah and the Great Flood. Meanwhile, programs discussing paranormal phenomena and alien abductions seem to proliferate.

There were two particularly disturbing aspects of the NBC program. First was the repeated implication that the scientific community was involved in a great conspiracy to suppress evidence. Second was the fact that viewers were offered an opportunity to purchase a copy of the program, and the ordering information implied that the network had a financial stake in the sales. I have no objection to any legitimate commercial activity, but the appearance of a financial interest on the part of the network only added to the credibility of the program.

There is no simple solution to this problem. However, one response would be to have an annual citation for programs