moment-of-inertia tensor of PSR0535−69 contains non-axisymmetric components ΔI comparable to the irregular fluctuations in I, then the rate of gravitational quadrupole radiation is $\sim 10^{43}\,(\Delta I_{39})^2$ erg s. (Here $I_{39} = I/10^{39}$ g cm^2.) The corresponding metric fluctuation at the Earth is $h \approx 10^{-25}\,\Delta I_{39}$. The empirical bound on the period derivative imposes an upper bound of $5 \times 10^{43}\,I_{45}$ erg s on the radiated power, unless it is offset by another process. The quadrupole power is radiated at the accurately known frequency 2ν. Higher non-axisymmetric multipole moments radiate at frequencies 3ν, 4ν and so on.

The rapid spin of PSR0535−69, approaching the limiting angular velocity of neutron stars[7], naturally suggests that it was spun up to this limit when it was formed, and is now slowing by the emission of electromagnetic or gravitational radiation. Internal cooling by neutrino emission produces contraction and angular momentum-conserving spin up. Exchange of angular momentum with a differentially rotating core may lead to a period derivative with either sign, or to fluctuations. Differential internal rotation may heat the star. It is possible that the neutron star is surrounded by an accretion disk of matter left over from the supernova with excess angular momentum. Then, as angular momentum is radiated away, accretion will maintain the pulsar on the $\nu_{max}(M_{NS})$ relation as M_{NS}, the neutron-star mass, increases. As in accreting binary neutron stars, irregularities in angular-momentum transfer could produce irregular variations in ν of the type observed. Accretion suggests the exciting possibility that the pulsar may be pushed over its limiting mass and collapse to a black hole or a more exotic configuration; the timescale would be determined by the (unknown) angular-momentum loss rate, and could be short.

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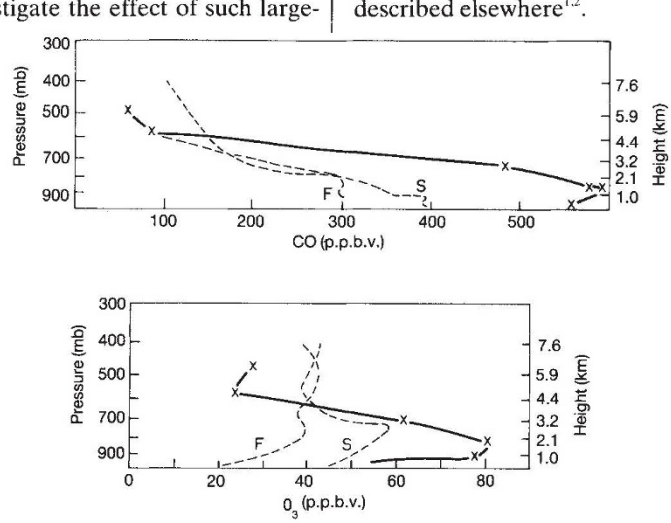
O_3 and CO from burning sugar cane

SIR—Brazil produced the first alcohol-powered automobiles after 1980, following a National Plan for reducing oil imports. They proved to be a great success: today 99 per cent of all manufactured vehicles for the internal market run on alcohol. Tropical countries make their sugar and alcohol from sugar cane. The manual harvest of sugar cane requires the initial burning of its foliage. This burning increased sharply in Brazil after the National Alcohol Programme was started. In 1988, more than four million hectares of sugar cane were grown in Brazil, about half of which was in the state of São Paulo.

To investigate the effect of such large-scale burning on the lower atmosphere away from the sources, two ozone sensors were installed on an airplane. One sensor used the ultraviolet absorption technique of ozone detection, the other used the chemiluminescent reaction between ozone and ethylene. Practically the same concentrations of ozone were detected by each instrument. In addition, air samples were collected systematically in special stainless-steel internally-electropolished cans (developed for sampling purposes by R. Rasmussen, Oregon Graduate Center) for subsequent CO, CH_4 and CO_2 analysis. Details of the analysis techniques are described elsewhere[1,2].



Atmospheric concentrations of CO and O_3 as a result of sugar cane burning (solid line) compared with biomass burning (broken lines).

The figure shows the profiles obtained for O_3 and CO. A very concentrated layer of gases was present, with peak concentrations at about two kilometres of 80 parts per 10^9 volume (p.p.b.v.) O_3 and 580 p.p.b.v. CO. These high concentrations, obtained in the rural area of the western part of the state of São Paulo, are about twice those reported for biomass burning events in Amazonia[3] over forest areas and savannah, and shown in the figure by dashed lines F and S, respectively. High concentrations of CH_4 (1,756 p.p.b.v.) and CO_2 (409 p.p.m.v.) were present at 1,500 metres. During the period of the experiment, the average diurnal variations in ground-based O_3 at two rural sites were practically identical to the typical urban variation observed at São José dos Campos, with daytime ozone values between 45 and 60 p.p.b.v.

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Chaotic names

SIR—Nobody would defend the present state of the genetic nomenclature of *Drosophila*. It is a mess. This is no excuse, however, for the cavalier attitude of some workers in the field. We refer, in this instance (but there are many others), to the paper by S.M. Cohen *et al.* (*Nature* **338**, 432–434; 1989) on the characterization of a gene they call *Distal-less*. As they acknowledge, this gene had been described two years previously by Sunkel and Whittle, who called it *Brista* — a perfectly good name and the one that should be used, as it has priority. If everyone was to follow the example of Cohen *et al.* a mess would rapidly become chaos.

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Erratum

In the Scientific Correspondence on cold fusion in the 18 May issue of *Nature* (p.184), the 24th line from the bottom of the 2nd column should read: "This value is a factor of 50 times higher than the rate that would be calculated on the basis of the results in Fig. 2 . . .". On the same page the first line of the acknowledgements should read: "We thank C. Kurz . . .".