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This Week

Research Notes

Articles

Cover: Kilauea is the world's most active, most heavily instrumented and most accessible volcano — even during eruptions. While each eruption brings scientists greater insight into the volcano, much is yet to be revealed. (USGS photo by J. Buchanan-Banks)

Departments

Letters

Contraceptive correction

In the article on slow release contraceptive systems (SN: 4/9/83, p. 236) you indicate that progestrones including levonorgestrel act on the female reproductive system by inhibiting ovulation and thickening the "walls of the uterus." This is not an accurate statement. I am not sure that anyone knows whether it thickens the walls of the uterus. What it should have said is that ovulation is inhibited much of the time but not all and that the drug "thickens the cervical mucus."

Dale N. Robertson, Ph.D.
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Counting black holes

Your article "A second black hole candidate" (SN: 5/7/83, p. 299) is in error when it describes LMC X-1 as the second black hole candidate. LMC X-1 is actually the fourth recognized black hole candidate (not counting active galaxy cores). It follows Cyg X-1, Cir X-1 and GX339-4. All are binary systems in which X-ray emission is powered by accretion into a deep gravitational well. Of the four, GX339-4 is probably the most interesting in that the accretion disk, which is the source of black hole X-ray emission, is also seen in visible light. This visible light has sometimes been observed to come in sporadic, shot-noise type bursts, such as characterizes black hole X-ray emission. Such bursty emission is the main signature of black hole candidates. For the other three sources white light emission from the accretion disk is masked by intense emission from a normal, highly luminous blue star companion. In contrast is GX339-4, the normal star that is the source of the accreting material, a low luminosity star. Black hole candidates produce X-ray emission only when in accretion flow binary systems, and are distinguishable from neutron star systems by the *lack* of any observable emission from the neutron star, which must inevitably be heated by the infall process. Neutron star emission is either precisely periodic due to channeled infall onto a rotating, highly magnetized body, or varies irregularly but relatively slowly due to variability in the accretion flow process. In contrast, when the degenerate member of a binary system is a black hole, X-ray emission is observed only from the inner portion of the accretion disk. This emission is chracterized by millisecond flickering resulting from intermittent instabilities that transfer angular momentum outward through the disk. Once material reaches the innermost stable orbit it spirals unseen into the interior of the black hole.

Talbot A. Chubb
Arlington, Va.

(What is a black hole candidate is something of a matter of confidence in theories. Our reference was to dynamical evidence yielding estimates of the mass of the dark object. We know only Cyg X-1 and LMC X-1 in that category. — Ed.)

DNA definition: Only partial credit

It is indeed a sad commentary on the state of science education that only 2 percent of the American people know what DNA is ("What is DNA?", SN: 6/4/83, p. 366). Unfortunately, the American Chemical Society and most writers of bioliogy textbooks are also confused when they state that DNA molecules "make copies of themselves." DNA is only a blueprint; it's the protein enzymes that do all of the synthesis, whether of more DNA or of the proteins the specifications for which are carried in the DNA molecule.

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