

SCIENCE'S COMPASS

for 15 minutes and samples taken again to determine stress-induced corticosterone concentrations from handling.

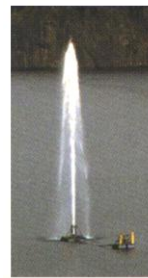
4. L. M. Romero and M. Wikelski, *Proc. Natl. Acad. Sci. U.S.A.*, in press.
5. General linear model repeated measures analysis of variance, $F(2,40) = 34.6$, $P < 0.001$; for oil versus non-oil, $P < 0.001$; for visible oil versus no visible oil, $P = 0.17$. Corticosterone levels were determined with a standard radioimmunoassay (assayed in quadruplicate). All samples were analyzed within one assay; intra-assay variation was $6 \pm 0.3\%$ SD, and the detection limit was 0.5 ng/ml.
6. The research described here was supported by the National Science Foundation under grant IBN-0118069.

Removing CO₂ from Lake Nyos in Cameroon

THE DEGASSING EXPERIMENT ONGOING AT Lake Nyos, Cameroon, is not "unprecedented," as John Pickrell says in his News of the Week article "Scientists begin taming killer lake" (9 Feb., p. 965). It was proved feasible, with pipes of the same diameter, at Monoun in 1992 and at Nyos in 1995. Water from the lake bottom travels up through the pipes, and the CO₂ is released in a jet of spray 45 meters high as it comes out of solution near the surface. Scaling up this experiment by adding five similar pipes will allow the elimination of

most of the 300 million cubic meters of CO₂ currently dissolved in the lake's deep waters within 5 years.

There are concerns, however, that water discharged from the jet might play the role of cold rainwater, sometimes put forward as the ultimate cause of the Nyos and Monoun limnic eruption disasters. Indeed, the ~2500 square meters of the lake surface sprinkled by the jet receive about the equivalent of a heavy tropical rain (~8 centimeters per hour). But the water resulting from the removal of CO₂ is not "dense" water—it is lighter than the bottom water precisely because it is not laden with CO₂. Moreover, it has been found that expansion of the gas en route to the surface through the degassing pipe is almost isothermal because of the low gas/water mass ratio of the fluid being vented—the 1.8°C temperature drop of the two-phase flow along the pipe brings the 25.2°C bottom water to a temperature very close to the mean temperature of surface water (22° to 23°C). Also, because the jet is 0.1 in relative density, it breaks down as a hazy spray that thermally equilibrates swiftly with air and mixes uniformly with surface water. Even in a worst case scenario, the penetration depth of discharged water has been calculated to be above the chemocline currently existing at 44 meters (1). Therefore,



concerns about cool water sinking and disturbing deep layers as a consequence of the degassing process are not relevant.

MICHEL HALBWACHS,¹ JEAN-CHRISTOPHE SABROUX²

¹Université de Savoie, BP 1104 Savoie Technolac, F-73376 Le Bourget du Lac, France; e-mail: mhalb@mail.univ-savoie.fr. ²Institut de Protection et de Sûreté Nucléaire, 389 Centre de Saclay, F-91191 Gif sur Yvette, France; e-mail: sabroux@accra.ipsn.fr

References and Notes

1. M. Kusakabe *et al.*, *J. Volcanol. Geotherm. Res.* **97**, 241 (2000).

Mutation in Embryonic Stem Cells

A SINGLE HUMAN EMBRYONIC STEM (ES) CELL might be modified in the laboratory to provide an unlimited supply of cells for therapy, according to Geron researcher Melissa Carpenter in the News Focus article "Stem cells: new excitement, persistent questions" (G. Vogel, 1 Dec., p. 1672). This seems, however, unlikely to be true. Mutations accumulate during DNA replication before cell division, at a rate of about 1 in 10 bil-

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