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Cover: Flocks of birds routinely perform mid-air maneuvers more complex than anything attempted by even the most practiced jet-fighter squadron. Moreover, no feathered "Top Gun" serves as a leader for these airborne entourages. Recent applications of mathematical chaos theory to in-flight bird behavior may explain the basics of coordinated movements within leaderless flocks – and perhaps even among panicky crowds of humans. (Photo: Alan Pitcairn/Grant Heilman Photography)

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Letters

Cold fission?

Has anyone considered the possibility that the anomaly of "cold fusion" experiments – high energy yields with few neutrons or tritium nuclei – might result from a case of mistaken identity? There are a number of nuclear *fission* reactions that produce neither neutrons nor tritium, yet yield large quantities of energy.

One interesting candidate is the fission of lithium-7 upon proton capture – i.e., $^{7}Li + {}^{1}H \rightarrow 2(^{1}He) + 17.3$ MeV. The enormous energy yield of this reaction (pound for pound, intermediate between deuterium-tritium fusion and uranium fission) is cleanly carried as kinetic energy by the two alpha particles (helium nuclei) generated. Secondary collisions of these alpha particles might be responsible for other, sporadically observed effects.

This reaction was first described by Cockroft and Walton almost 60 years ago, but their main interest was in astrophysics, not earthly energy generation, and the interest of the subsequent Manhattan Project was in chain reactions – something you could make a bomb with. The possibility that the energy of such a clean nuclear reaction as lithium-7 fission might be harnessed for everyday use is all the more intriguing, since lithium (a cheap and abundant element) seems to be a crucial component of Pons-Fleischmann-type "cold fusion" experiments.

By varying isotope ratios in the lithium component (ordinary lithium is mostly lithium-7, with an appreciable amount of lithium-6), one should be able to determine whether this or a similar reaction (such as the fission of lithium-6 upon deuteron capture) is responsible for any of the "cold fusion" effects thus far observed.

Joel Brind
Associate Professor of Natural Sciences
Baruch College
City University of New York
New York, N.Y.

Day-ants on the wane?

Could not the intriguing observation reported in "Who says ants are airheads?" (SN: 12/23&30/89, p.412) be explained by a factor other than evolutionary necessity or intelligence?

Just as there are day-persons and night-persons, ants perhaps can be divided into day and night types, too. If this preference is influenced by heredity, then the night-ant strains would be safe from the parasitic flies. If so, the explanation for the disproportionate number of ants whose heads exceed 1.6 millimeters seen foraging after dark is not that the ants put off foraging until after dark, nor that they are adapting to evolutionary necessity, but that the day-foraging strains are being finished off.

T.S. Nataraj
Houston, Tex.

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