electromagnetic field. But natural scientists often use such expressions. Describing his thinking process, Jacques Monod wrote, "Let the attention so concentrate on the imagined experience as to be oblivious to all else, and . . . one may suddenly find oneself identifying with the object itself, with, say a molecule of protein" (*1*).

To understand a system one must empathize with it—in effect become that system in imagination—as Monod said he did. When a scientist with a deep understanding of a system reports on its behavior we should not be surprised by the use of affective (even poetic) language in which machines "hesitate," plants "dislike," and atoms "feel."

This point appears to be lost on those who argue, for example, that introductory physics courses should concentrate on contemporary matters and include extensive descriptions of quarks, black holes, and other exotica. Mastery of the theory of phenomena directly experienced (bouyancy, elasticity, levers, and pulleys) allows a student to learn through bodily experiences—both real *and* imagined—that promote understanding of the natural world (Einstein reported that his thinking was "of a muscular nature"). To move too fast into formal (algorithmic) thinking is to sacrifice the imaginative flexibility that allows a science student to understand a system, or a creative scientist to "live" in an abstract theoretical world.

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Asbestos and Carcinogenicity

It is alleged by William J. Nicholson *et al.* (Letters, 18 May, p. 796) that there have been 67 or more cases of mesothelioma among "Quebec chrysotile miners and millers" and that one of us (J. C. McD.) was responsible for this estimate. Of the many thousand individuals employed by the Quebec chrysotile mining and milling industry since its inception, no one knows how many have died or of these how many from mesothelioma. At a 1989 meeting in Ottawa, Ontario, Canada, one of us (J. C. McD.) stated that in our cohort of 11,379 persons born between 1891 and 1920 and employed for 1 month or more, there had been 11 cases of mesothelioma among 4,547 deaths to the end of 1975 (*1*); by 1978 we knew of 18 cases (*2*), and a follow-up to 1990 will soon be completed. More than 70% of the cohort have now died, and a study of a subsample indicates that the eventual number of cases of mesotheliomas may be about 30. A disproportionate number of these (at least seven) were exposed to crocidolite in a small local factory, and we know that one had substantial exposure to amosite. Could the remaining cases be attributed to fibrous tremolite contamination (roughly estimated at about 1.5%)? Again, no one knows for certain but, on the basis of the exposure-response data for mesothelioma in cohort studies of Montana miners and millers whose only mineral fiber exposure was to tremolite (*3*), it seems possible. Whether or not chrysotile per se is capable of inducing mesothelioma, it is clear that workers whose exposure has been only to commercial chrysotile have suffered much less from mesothelioma than, for example, those exposed for even a few months to crocidolite in gas mask filter manufacture (*4*) or cigarette filter manufacture (*5*), in whom 16 to 19% of all deaths were attributable to this cause. In the general population of the Quebec chrysotile mining towns, exposed over generations to chrysotile concentrations far greater than anything encountered in public buildings, there have been few if any cases of mesothelioma attributable to nonoccupational exposure.

Nicholson *et al.* describe studies that count and type mineral fibers in lung tissue at autopsy as "nearly worthless." We ourselves have urged caution in the interpretation of such studies unless they are carefully controlled (*6*); nevertheless, two points should be recognized. Although chrysotile fibers appear to penetrate the airways less well and are removed more rapidly than the amphiboles, their concentration at autopsy reflects quite well past levels of exposure in both chrysotile miners and millers and chrysotile textile workers (*7*). The fact well-controlled studies show that the concentration of amphibole, but not chrysotile, fibers in the lung tissue of patients with mesothelioma consistently exceeds that of con rols has considerable etiological significance and is in line with the mass of other epidemiological evidence (*8*).

We are not sure what Nicholson *et al.* mean by the "amphibole hypothesis," but surely it relates to mesothelioma and not to lung cancer. The arguments against the hypothesis produced by Nicholson *et al.* on the basis of the lung cancer experience of asbestos textile workers are therefore not relevant. In the four studies cited by Nicholson *et al.*, the two of one plant that used only chrysotile had virtually the same steep exposure-response curve for lung cancer as did the two other plants, where small but significant amounts of commercial amphibole were also used. In the chrysotile-only plant, despite intensive search, only one case of mesothelioma was detected; whereas in both mixed-exposure plants there were numerous cases—12 in one and 14 or more in the other. Much the same pattern has been observed in two similarly contrasting friction plants (*8, 9*).

To those of us who have spent our lives in public health research it seems strange and sad that a country with one of the highest infant mortality rates in the Western world and no shortage of other health and behavioral problems should commit billions of dollars to the questionable control of a minuscule or nonexistent health risk. Perhaps the real problems are too difficult.

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Erratum: On page 1198 (column 2, line 23) of the article "Chiral metal complexes as discriminating molecular catalysts" by R. Noyori (8 June, p. 1194), hydroxymethylglutaryl–coenzyme A reductase was incorrectly identified as "human menopausal gonadotropin–coenzyme A reductase."

Erratum: In the research article "Functional domains and upstream activation properties of cloned human TATA binding protein" by M. G. Peterson *et al.* (29 June, p. 1625), the amino acid glutamine was incorrectly abbreviated "Glu" in the caption for figure 1C (p. 1626) and three times in the third paragraph on page 1627. The correct abbreviation is Gln. In addition, the third paragraph of the article (p. 1625) should have begun, "In vitro reconstituted . . . transcription. . . ."

Erratum: In the report "Spatial variation of ozone depletion rates in the springtime antarctic polar vortex" by Y. L. Yung *et al.* (11 May, p. 721), the maximum observed value of ClO attributed to J. G. Anderson *et al.* [*J. Geophys. Res.* **94**, 11465 (1989)] (p. 723) was incorrect. The observed maximum ClO mixing ratio was $\sim 1.2 \times 10^{-9}$ (by volume) throughout the flight sequence from 23 August through 22 September 1987 at ER-2 cruise altitude (potential temperature ~440 K).