tact cell types [see discussion (*3*)] and can be shown to cross cell membranes rapidly and routinely (*16*). Thus the highly supportive pieces of interlocking data now in hand suggest that the negative comments of our critics in no way weaken our hypothesis and therefore need not be considered further.

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References and Notes

1. By our calculation, Godfraind and Pumain find that nearly 60 percent of their tested cells do not respond to cyclic AMP, compared to 17 percent of our identified Purkinje cells. Negative results are common in microiontophoretic experiments [see discussions of H. McLennon, *Nature* **288**, 674 (1970) and D. R. Curtis, A. W. Duggan, D. Felix, G. A. R. Johnston, *ibid.*, p. 676, as opposed to that of J. M. Godfraind, K. Krnjević, R. Pumain, *ibid.*, p. 675] and require cautious interpretation [see B. J. Hoffer, N. H. Neff, G. R. Siggins, *Neuropharmacology* **10**, 175 (1971)].
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8. We have now tested 193 Purkinje cells with iontophoresis of cyclic AMP; 83 percent of these respond to cyclic AMP, 62 percent with depression of discharge, 14 percent with elevated firing rates, and 7 percent with mixed biphasic or reversible responses. It may be more than fortuitous that the percentage of our cells responding with depression equals the negative responses of Godfraind and Pumain.
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Paramagnetic Ions in Zoisite

We have carried out a study of transition metal impurity ions in zoisite by electron paramagnetic resonance. Our results will be reported elsewhere (*1*), but, since they are considerably at variance with those of Ghose and Tsang (*2*), we present a preliminary account of them here. The measurements were made with standard 3-cm and 8-mm spectrometers, each having full rotation facilities for the magnet and the specimen. Specimens studied included heated gem-quality and unheated natural crystals (*3*) from Tanzania.

All our evidence suggests the presence of Fe^{3+}, Cr^{3+}, Mn^{2+}, VO^{2+}, and V^{4+} ions. The various spin Hamiltonian parameters and the orientations of the magnetic axes are given in Table 1.

The single anisotropic line at a wavelength of 3 cm detected by Ghose and Tsang and attributed by them to Fe^{3+} is in fact due to Cr^{3+}. Its anisotropy from an effective spectroscopic splitting factor g of 2 to 4 labels it as a $-\frac{1}{2}$ to $+\frac{1}{2}$ transition in the $|\pm\frac{1}{2}>$ doublet of an S (electronic spin) $= 3/2$ spin system with large crystal-field splitting. The presence of Mn^{2+} forbidden transitions along the magnetic z- and y-axes indicates that the cubic field and the lower symmetry tensors do not have the same principal axes (*4*). This result might be expected if the Mn^{2+} substitutes into a very low-symmetry Ca^{2+} site.

The assignment of the vanadium lines to VO^{2+} and V^{4+} (d^1) follows from the temperature dependence of the spectra and the absence of fine structure lines that would characterize V^{2+} (d^3). The small anisotropy in g at a wavelength of 3 cm and the absence of fine structure at the Q band precludes the possibility that the spectra are due to V^{2+} with large zero field splittings. Because the axes of the vanadium sites correlate strongly with those of the Al nuclear quadrupole tensors (*5*), we would allocate the VO^{2+} to Al substitutional sites.

Our experience in the field of magnetic resonance in mineralogy has led us to the conclusion that full rotation facilities for crystal and magnet, and the use of at least two widely separated frequencies, are essential for such studies.

Table 1. Ion spin Hamiltonian parameters and orientations in zoisite.

Spin Hamiltonian parameters*	Orientation
	$(VO^{2+})_1$
$g_z = 1.948 \pm 0.001$, $A_z = 163.4 \pm 0.2$ $g_y = 1.968 \pm 0.001$, $A_y = 53.3 \pm 0.2$ $g_x = 1.942 \pm 0.001$, $A_x = 49.2 \pm 0.2$	The z-axis is 39° from the b-axis, 7° from the (100) plane; the x-axis is in the (100) plane; four sites.
	$(VO^{2+})_2$
$g_z = 1.938 \pm 0.001$, $A_z = 161.7 \pm 0.2$ $g_y = 1.928 \pm 0.001$, $A_y = 52.5 \pm 0.2$ $g_x = 1.944 \pm 0.001$, $A_x = 45.2 \pm 0.4$	The z-axis is in the (010) plane, 11° from the a-axis; the y-axis is parallel to the b-axis; two sites.
	Fe^{3+}
$g = 2.000 \pm 0.001$ $D = 0.787 \pm 0.004$ $E = 0.015 \pm 0.001$	The z-axis is parallel to the a-axis; the y-axis is parallel to the b-axis; one site.
	Cr^{3+}
$g_{\parallel} = 1.9705 \pm 0.0005$ $g_{\perp} = 1.975 \pm 0.001$ $D = 0.636 \pm 0.0003$ $E = 0.0277 \pm 0.0003$	The z- and y-axes are in the (010) plane, 45° from the a and c axes; two sites.

* The parameters may be defined as follows: g is the spectroscopic splitting factor; A is the hyperfine interaction constant; and D and E (in reciprocal centimeters) are crystal-field parameters.

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