

$-\frac{1}{2}e$. The end-product that reaches the earth's surface is thus a massive and lightly ionizing particle of the variety that has been discussed by Yock & Johnson (1970). Its arrival at the earth's surface is delayed with respect to the arrival of the leading shower particles, and its direction may be significantly different from them. These features may be not inconsistent with the observations of McCusker (1969).

One qualification of the above scenario is necessary. If the free antiquark created in the original cosmic-ray interaction happens to be of the $\bar{4}$ variety, then it would be annihilated by a type-4 quark at its first nuclear encounter. (We recall here that the quark configuration of the nucleon is $4\bar{2}\bar{2}$ in the six-quark Theory.) The residue of such an annihilation process would be a moderately energetic nucleus with two type- $\bar{2}$ 'unbalanced' antiquarks attached to it. This object would traverse the earth's atmosphere in the manner outlined above. Thus it would decelerate and pick up atmospheric nuclei to become finally a massive and lightly ionizing particle.

A more quantitative description of the above phenomena, together with a discussion of the fate of free quarks created in cosmic-ray interactions, will be reported in a forthcoming publication.

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References

- Cairns, I., McCusker, C. B. A., Peak, L. S. and Woolcott, R. L. S. (1969). *Physical Review* (in press).
 McCusker, C. B. A. and Cairns, I. (1969). *Physical Review Letters*, **23**, 658.
 Yock, P. C. M. (1969). *International Journal of Theoretical Physics*, Vol. 2, No. 3, p. 247.
 Yock, P. C. M. and Johnson, R. C. (1970). *International Journal of Theoretical Physics*, Vol. 3, No. 1, p. 80.

Errata

- (1) Vol. 2, No. 3 (1969), pp. 319–323. Dr. Browne has stated that he considers equation (15) is 'unnecessary to assume'. Further, he states $(\mathbf{v} \times \mathbf{a}/c)^2 \rightarrow \mathbf{a}^2$ is incorrect and does not follow from (9). A more detailed commentary on *The Implicit Spin Magnetic and Electric Moments of an Electron* is not available at present, but intending readers should take heed. There are a number of trivial miswritings.
- (2) Vol. 2, No. 3 (1969), pp. 247–254. *Unified Field Theory of Quarks and Electrons*. In the caption to Figure 2, β_μ should be B_μ .