It is clear that through Eq. (36) the axial charge radius is related to the vector charge and magnetic radii. This connection can be simplified by using our results pertaining to the saturation of the vector-current algebra under the same conditions.[5] The relevant results are[5]

$$F_1'^V(0)=\tfrac{1}{2}(F_2^V(0)/2M)^2+\tfrac{1}{2}a-\tfrac{1}{4}b\,, \tag{37}$$

$$F_2'^V(0)=F_2^V(0)[\tfrac{1}{6}(F_2^V(0)/2M)^2+\tfrac{1}{3}a-(1/24)b], \tag{38}$$

$$-\tfrac{1}{4}(a+b)=\langle p|J_3'J_3'|p\rangle_c\,, \tag{39}$$

where $F_2^V(0)/2M$ is the anomalous isovector magnetic moment and

$$F_1'^V(0)\equiv(d/dq^2)F_1^V(q^2)|_{q^2=0}\,,$$

etc. Since as $p_z\to\infty$, with q along the x axis,

$$\langle p|J_+(q)|n\rangle=F_1^V(q^2)-i(\sigma_2q_x/2M)F_2^V(q^2)$$

and

$$q^2=q_0^2-\mathbf{q}^2\to -q_x^2\,,$$

it follows that

$$\langle p|J_3'|p\rangle=i(F_2^V(0)/2M)\tfrac{1}{2}\sigma_2\,, \tag{40}$$

$$\langle p|J_+''|n\rangle=-2F_1'^V(0)\,, \tag{41}$$

$$\langle p|J_+'''|n\rangle=i(F_2'^V(0)/2M)6\sigma_2\,. \tag{42}$$

Using Eqs. (37)–(42) in (36), it follows that

$$G_1(0)G_1'(0)=6(F_2'^V(0)/F_2(0))+F_1'(0)$$
$$-\tfrac{1}{2}(F_2^V(0)/2M)^2\,. \tag{43}$$

After substituting $F_1'^V(0)=0.0909$ F^2, $F_2'^V(0)=0.116$ $F_2^V(0)$, and $F_2^V(0)=3.7$, we obtain

$$G_1'/G_1(0)=1/G_1^2(0)\times 0.7\text{ F}^2\,.$$

Using the experimental value[8]

$$G_1(0)=1.20\pm0.02$$

gives

$$G_1'/G_1(0)=0.48\text{ F}^2\,. \tag{44}$$

[8] G. Conforto, Symposium on Weak Interactions, Balatonvilagos, 1966 (unpublished).

IV. DISCUSSION AND CONCLUSIONS

This calculation has been motivated in an effort to find a scheme which can combine and parametrize some of the quantities that appear in the evaluation of the higher moments of vector and axial form factors. For instance, it is known that the approximation of keeping the (3,3) resonance alone gives a poor fit to the isovector charge radius.[9] However, through Eqs. (37) and (38) we can parametrize the transitions from the nucleon to *all* $I=\frac{1}{2}$, $\frac{3}{2}$ states, with parameters a and b, respectively. In Ref. (5) we have examined the consequences of the scheme described above as far as it determines the isovector-nucleon form factor and found that its low-energy predictions are consistent with experiment.

The method described above can also be used to find a closed form for $G_1(q^2)$ starting from Eq. (5)—the result depends only on the electric and magnetic isovector radii and $G_1(0)$. Of course, this result may be premature and must await for the satisfactory comparison of the predicted axial-vector charge radius with experiment.

From Eq. (44) we obtain[10]

$$r_A/r_V\equiv(G_1'(0)/G_1(0)/F_1'(0))^{1/2}=2.06\,.$$

The calculation of Furlan, Jengo, and Remiddi,[11] keeping the (3.3) resonance only, gives $r_A/r_V=0.50$—0.56, whereas the analysis of the 1963-1964 CERN experiments predict $r_A/r_V=1.04_{-0.14}^{+0.34}$.[12] However, the possible systematic error which may arise from the dipole fits used in their analysis is difficult to assess.

[9] N. Cabibbo and L. A. Radicati, Phys. Letters **19**, 697 (1966).

[10] In order to obtain uniform comparison we have used $F_1=F_2=[1+q^2/(0.84)^2]^{-2}$ to calculate the denominator here and in the following. See Ref. 12.

[11] G. Furlan, T. Jengo, and E. Rimiddi, Phys. Letters **20**, 1679 (1966); see also, Riazuddin and B. W. Lee, Physics **146**, 1202 (1966); **150**, 1406(E) (1966).

[12] E. C. M. Young, CERN Report No. 67-12 (unpublished). These numbers apply to the predictions under assumption A. This choice has been made on the basis of the better agreement of F_1 and F_2 with electromagnetic form factors at low momenta.

Errata

Partially Conserved Axial-Vector Current, Charge Commutators, Off-Mass-Shell Correction, and the Broken *SU*(3) Symmetry,* S. MATSUDA† AND S. ONEDA [Phys. Rev. **158**, 1594 (1967)]. The following references indicating the support of our research should be added to the title: * Supported in part by the National Science Foundation under contract No. NSF GP-6036. † This research contains part of the thesis research of S. Matsuda to be submitted to the University of Maryland in partial fulfillment of requirements for a Ph.D. degree in physics.

Steady State of Cosmic-Ray Nuclei—Their Spectral Shape and Path Length at Low Energies, R. COWSIK, YASH PAL, S. N. TANDON, AND R. P. VERMA [Phys. Rev. **158**, 1238 (1967)]. In the formulation on pp. 1239–40, $P(E)$ should refer to the production spectrum per unit time and not to the production spectrum per g/cm^2.