II. BOUNDS

We focus on the neutrino reactions and their structure functions $F_i(\omega,q^2)$, $i = 1,2,3$. Here q^2 is the negative of the invariant momentum transfer and $\omega = 2m\nu/q^2$ is the Bjorken scaling variable. Strict scaling would imply that the $F_i(\omega,q^2)$ approach finite limits as $q^2 \to \infty$, for fixed ω. However, we are contemplating the possibility of departures from scaling; and on present thinking such departures are expected to take on their most characteristic shape when expressed in terms of the large q^2 behavior of the <u>moments</u> of the structure functions,

$$F_i^{(n)}(q^2) = \int_1^\infty d\omega\, \omega^{-n-2}\, F_i(\omega, q^2). \tag{1}$$

For the asymptotically free theories under discussion the moments are predicted to display logarithmic deviations from scaling. Namely, for q^2 large enough (how large may in general depend on the order n of the moment) the predicted asymptotic behavior is

$$F_i^{(n)}(q^2) \longrightarrow b_n(i)\left(\log\frac{q^2}{\mu^2}\right)^{-a_n(i)}, \tag{2}$$

where μ is a scale parameter not specified by the theory. The coefficients $b_n(i)$ are similarly unspecified; but the exponents $a_n(i)$ are definite and characteristic of the underlying theory. They can be computed explicitly, given the gauge group and the quark content of the theory.