We wish to consider here some of the constraints on the underlying quark structure of matter that might be extracted from weak phenomena, for processes involving possible hadrons with new quantum numbers but also processes involving only ordinary hadrons. The latter, of course, provide only indirect information, but this can be useful. The point is that new, heavy quarks can have important effects on the weak interactions of the light, p, n, λ quarks:

(1) Nonleptonic weak decays and certain higher order weak effects probe momenta of order M_W, the intermediate vector boson mass. At these momenta all quarks of mass $< M_W$ can have important dynamical effects, and the ideas of asymptotic freedom provide a rough quantitative basis for assessing these effects.

(2) Neutral current phenomena, even for ordinary hadrons, take on a structure which is, of course, set by the nature of the weak couplings of the ordinary quarks, among themselves but also in combination with new quarks.

Throughout this paper we adopt for the weak interactions the general $SU(2) \times U(1)$ gauge-theory framework of Weinberg and Salam,[4] assigning all quarks to singlets or doublets of the weak SU(2). Quark charges are either 2/3 or -1/3. When questions of strong interaction dynamics arise we adopt a color gauge theory of the strong interactions, with all quarks assigned to triplets of color SU(3). The options, therefore, have to do with the number of quark types introduced as a basis for hadronic matter