Salam, Landau and Lee and Yang postulate a combination of vector and axial vector for the lepton current in $\beta$-decay: $\mathcal{L}_\beta = \frac{G_\beta}{\sqrt{2}} J^\mu_{\text{had}} \bar{e}(x) \gamma_\mu (1 - \gamma_5) \nu_e(x)$ This describes the experimental observation that parity is (maximally) violated.

1958:
Goldhaber et al. demonstrate that the neutrino has lefthanded helicity.

Due to the V-A structure of the weak interaction and the masslessness of the neutrinos, only lefthanded neutrinos and righthanded anti-neutrinos occur in $\beta$ decays.

1961:
Danby et al. perform the first accelerator neutrino experiment and find that there are two species of neutrinos $\nu_\mu \neq \nu_e$.

“The theory of the eightfold way”
Gell-Mann and Ne’eman classify all hadrons according to representations of the (flavor-) SU(3) group with the isospin group SU(2) and U(1) of the hypercharge ($Y = B + S$) as subgroups. $I = (Q_{\text{max}} - Q_{\text{min}})/2, Y = Q_{\text{min}} + Q_{\text{max}}$ where $Q_{\text{min, max}}$ are the minimal and maximal charges in the isospin multiplet. Gell-Mann-Nishijima relation: $Q = Y/2 + I_3$
Hadrons with same total angular momentum, parity ($J^P$) and baryon number are arranged in SU(3) multiplets:

[1]: $I=0, Y=0$, [6]: $I_{max} = 1, Y = -4/3, -1/3, 2/3$, [8]: $I_{max} = 1, Y = -1, 0, 1$, [10]: $I_{max} = 3/2, Y = -2, -1, 0, 1$

1962:
Okubo develops a formula for the masses of baryons belonging to one multiplet (Gell-Mann-Okubo mass formula) by using group theoretical arguments:

$$M = a + bY + c[I(I + 1) - \frac{1}{4}Y^2]$$

Gell-Mann uses it to predict the mass of the $\Omega^-$, whose existence is predicted by the theory of the “eightfold way”.

1963:
Cabibbo introduces a hadronic current, $J^\mu_{had}$, with a structure slightly different from the leptonic current to explain strangeness changing leptonic weak decays (e.g., $K^+ \rightarrow \mu^+\nu_\mu$) and that $G_\beta/G_\mu \approx 0.98$:

$$d \rightarrow d' = \cos \theta_c d + \sin \theta_c s; \quad J^\mu_{had} = \bar{u}(x)\gamma^\mu(1 - \gamma_5)d'(x)$$

so that $G_\beta/G_\mu = \cos \theta_c \approx 0.98$. 
$G_\beta$ : coupling constant in $\beta$-decay, $n \rightarrow p e^- \bar{\nu}_e$

$G_\mu$ : coupling constant in $\mu$-decay, $\mu^- \rightarrow \nu_\mu e^- \bar{\nu}_e$

**Universality of the weak interaction:**

$G_\beta = G_F \cos \theta_c$ and $G_\mu = G_F$, where $G_F$ is Fermi’s constant.