1035-Z1-477 **H. Vic Dannon*** (vick@adnc.com). *Cardinality and Measure.*

Lebesgue defined the measure of an interval to be its length. He defined the measure of the union of infinitely many disjoint intervals in [0,1] to be the sum of the intervals' lengths. For a general set, such as the rationals in $[0,1]$, he listed all the rationals in a sequence

$$\{r_1, r_2, r_3, ...\}$$

and covered them by the intervals

$$(r_1 - \tfrac{1}{4}\varepsilon, r_1 + \tfrac{1}{4}\varepsilon),$$

$$(r_2 - \tfrac{1}{8}\varepsilon, r_2 + \tfrac{1}{8}\varepsilon),$$

$$....................$$

of lengths

$$\frac{1}{2}\varepsilon, \frac{1}{2^2}\varepsilon, \frac{1}{2^3}\varepsilon, ...$$

Then,

$$m(E) \leq \frac{1}{2}\varepsilon + \frac{1}{2^2}\varepsilon + \frac{1}{2^3}\varepsilon + ... = \varepsilon.$$

Taking the infimum on $\varepsilon > 0$, he effectively set ε to zero, and concluded that $m(E) = 0$. We have reservations about this procedure. posted to www.gauge-institute.org (Received September 08, 2007)