tion of power efficiencies, so that little error in power efficiencies would be expected if the approximation were used for $n = 6$, $\alpha = .01$ or $n = 4$, $\alpha = .05$, the efficiencies given in Table II for $n = 4$, $\alpha = .05$ and $n = 4, 6$, $\alpha = .01$ were obtained from the exact values by graphical interpolation and cross-interpolation.

Power efficiencies were not considered for $n < 4$ because of the difficulties of interpolation and the inexactness of the normal approximation in this range.

For $n = \infty$, t_1 and t_2 both have a normal distribution with zero mean and unit variance. Thus the power efficiency is 100% at all significance levels for this case.

These computations furnish approximate power efficiencies for $n = 6, 8, 10, 15, 25, \infty$ at $\alpha = .05, .025, .01$, and for $n = 4$ at $\alpha = .05$ and .01. The other approximate power efficiencies listed in Table II were obtained by graphical interpolation from these values.

The results of this note can be roughly summarized for $n \leq 15$ by stating that of the $2n$ sample values

(i). approximately 1.6 values are lost at the 5% significance level,

(ii). approximately 2.1 values are lost at the 2.5% significance level,

(iii). approximately 2.8 values are lost at the 1% significance level, if the tests based on t_1 are used instead of the corresponding tests based on t_2. Examination of Table I shows that the number of sample values lost decreases as n increases for $n > 15$.

REFERENCES

[1] JOHN E. WALSH, "On the power function of the sign test for slippage of means", *Annals of Math. Stat.*, Vol. 17 (1946), pp. 360, 361.

[2] N. L. JOHNSON AND B. L. WELCH, "Applications of the non-central t-distribution", *Biometrika*, Vol. 31 (1940), p. 376.

[3] J. NEYMAN, "Statistical problems in agricultural experimentation", *Roy. Stat. Soc. Suppl.*, Vol. 2 (1935), pp. 131, 132.

NOTE ON THE LIAPOUNOFF INEQUALITY FOR ABSOLUTE MOMENTS

BY MAURICE H. BELZ

The University of Melbourne

For a variate x measured from the mean of the population, the absolute moment of order r is defined by

$$\nu_r = \int_{-\infty}^{\infty} | x |^r \, dF(x),$$

where $F(x)$ is the cumulative distribution function. Treating r as continuous, we have

$$\frac{d\nu_r}{dr} = \int_{-\infty}^{\infty} | x |^r \log_e | x | \, dF(x),$$

the integral on the right existing if ν_{r+1} exists.