5 indicates that with a landing-gear diameter of 320 in. the vehicle is stable for slopes up to 15.6°. However, to achieve this same capability using a vertical spring constant per leg of 18,000 lb/in. requires a landing-gear diameter of 380 in., an increase of about 19%. Keeping the diameter of 320 in. and the effective vertical spring constant per leg of 18,000 lb/in. (an order-of-magnitude estimate for full scale vehicles), the vehicle is stable on slopes of only 11° or less. Thus, the elasticity effect is seen to be very important, an effect for which both the writer's method of Ref. 5 and Cappelli's method of Ref. 3 fails to account.

Since most scale model drop test vehicles seem to be rather rugged and stiff, the effective vertical spring constant per leg is generally large as compared to the value necessary for proper dynamic scaling. Assuming a $\frac{1}{6}$ scale model, the effective vertical spring constant should be only $\frac{1}{6}$ of the full scale value. Thus, although a particular method may agree favorably with experimental drop tests of rather stiff models, the method may actually be quite optimistic for full-scale vehicles landing on the moon.

References

[1] Cappelli, A. P., "Reply by author to R. E. Lavender," AIAA J. 2, 412–413 (1964).

[2] Lavender, R. E., "Comment on 'Dynamic analysis for lunar alightment,' " AIAA J. 1, 2196–2197 (1963).

[3] Cappelli, A. P., "Dynamic analysis for lunar alightment," AIAA J. 1, 1119–1125 (1963).

[4] Black, R. J., "Quadrupedal landing gear systems for spacecraft," J. Spacecraft Rockets 1, 196–203 (1964).

[5] Lavender, R. E., "Touchdown dynamics analysis of spacecraft for soft lunar landing," NASA TN D-2001 (January 1964).

[6] "A comparative design study of modular stage concepts for lunar supply operations (U)," TRW Space Technology Labs. Rept. 8495-6015-RL000, Vol. IIA (December 12, 1963); confidential.

[7] Lavender, R. E., "Equations for two-dimensional analysis of spacecraft with hinged legs including elastic, damping, and crushing effects," George C. Marshall Space Flight Center MTP-AERO-63-76 (November 6, 1963).

Erratum: "Experimental Convective Heat-Transfer Measurements"

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CONVECTIVE heating comparisons between experiment and theory are given in Fig. 4 of the paper. Unfortunately typographical errors in Ref. 1 were propagated into these comparisons. The corrected comparisons are shown in Fig. 1.

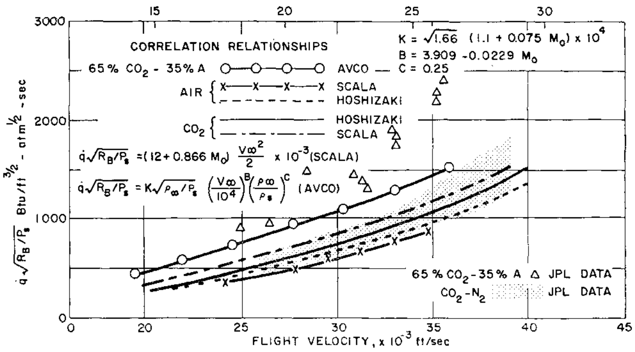

Fig. 1 Comparison of theoretical and experimental results.

Reference

[1] "Mars-Venus capsule parameter study," Avco Corp., RAD-TR-64-1, Vol. 1, pp. 78–81 (March 1964).

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