$$C/(2)^{1/2} = 0.539\ \sigma^{0.3776}\ [1 - 0.0075(\sigma - 1)^2 + \ldots] \quad \text{(three-dimensional)}$$

One can see why the $\sigma^{0.4}$ law is a good representation. The more accurate powers make a noticeable difference only for $\sigma \geq 2$.

The importance of these power laws is enhanced by the well-known fact that they hold quite well in compressible flow and even for heat transfer from dissociating air.

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Reply by Author to N. H. Kemp

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THE author must accept N. H. Kemp's corrections on the two arithmetical points he mentions and is pleased to know that they improve the theoretical basis for the 0.65 power law, which Crocco had found to agree very closely indeed with his computed values of s. The remarkable thing is that, as seen in Fig. 5 of Crocco's paper (Ref. 2 of the preceding comment), this agreement extends certainly as far as $\sigma = 2$. The asymptotic value as $\sigma \to \infty$, also obtained in the paper, is, however, $1.02\ \sigma^{-2/3}$. The further use that Kemp has made of the technique is very interesting.

The author would also like to take this opportunity to correct two minor misprints in his note:

1) On the left-hand side of the equation above (9), the quantity operated upon is $(r/\sigma^{1/2})$.

2) The term on the extreme left of Eq. (12) should carry the suffix $\sigma = 1$.

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