excellent reference for hypersonic viscous effects which can be treated with boundary-layer theory (Chapters VIII and IX).

Chapter X gives a very complete qualitative discussion of the general features of rarefied gas flows, covering the gamut from low Reynolds number continuum flow to free molecule flow. For the free molecule flow regime, results for forces and heat transfer are given.

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55[V, X].—CHARLES J. THORNE, GEORGE E. BLACKSHAW & RALPH K. CLAASSEN, *Steady-State Motion of Cables in Fluids, Part I., Tables of Neutrally Buoyant Cable Functions*, NAVWEPS Report 7015, Part 1 NOTS TP 2378, China Lake, California, 1962, xxxii + 400 (approx.) unnumbered pages, 22 cm.

An approximate solution for the shape and tension of a neutrally buoyant flexible cable in a stream is expressible in terms of the functions

$$\tau = \exp\left(\frac{F}{R}\cot\phi\right), \qquad \xi = \int_{\phi}^{\pi/2} \tau \cot\phi \csc\phi \, d\phi, \qquad \eta = \int_{\phi}^{\pi/2} \tau \csc\phi \, d\phi$$

where $R/F = 45$. A brief table of these functions was given by Landweber and Protter (*Jour. Appl. Mech.*, 1947). In the present work these functions are tabulated for much smaller increments of the variable. Various combinations of these functions that are useful in solving certain types of cable problems are also tabulated.

Since the assumed laws of the forces on a cable are empirical and approximate, it is interesting to observe that by a slight alteration in the physical assumptions, due to R. K. Reber of the Navy Department, Bureau of Ships, the differential equations can be made integrable. Assuming that, instead of a constant tangential component, there is a constant force F per unit length in the downstream direction, the differential equations (5) and (6) in the book would be replaced by

$$\frac{dT}{ds} = F\cos\phi$$

$$T\frac{d\phi}{ds} = -R\sin^2\phi - F\sin\phi$$

It is readily verified that the functions corresponding to ξ and η obtained from these differential equations are exactly integrable. This has the obvious advantage of enabling neutrally buoyant cable problems to be solved with the aid of trigonometric tables.

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56[X].—CHARLES ANDERSEN, "The Ruler Method, An Examination of a Method for Numerical Determination of Fourier Coefficients," *Acta Polytechnica*