cylinders used were fairly large, that the velocity fields involved were all practically zero, and the actual contours of the interface were very carefully observed.

II. Some doubts on the validity of assuming the Taylor-type interface instability in determining the dominant unstable wavelength in film boiling in the case of the discusser's paper.

The author would like to mention two observations on the influence of the existing nonzero flow on the dominant unstable wavelength:

1 In the course of the experimental work reported in the author's paper, it was observed that a slight draft in the surrounding air in a direction perpendicular to the axis of the body would change the observed dominant unstable wavelength drastically.

2 In a recent study made by the author (in preparation for publication) on the instability of a moving sheet of liquid in still air, the expression relating the dominant unstable wavelength to the thickness of the sheet is found to agree in spirit with the expression relating the dominant unstable wavelength to the radius of the wire used in the experiments as reported in the discusser's paper.

Based on these observations, the author would tend to suggest that perhaps a modified predominately Helmholtz-type interface instability analysis, instead of a Taylor-type analysis, would be more applicable to the experimental model of the discusser's paper. Furthermore, it should also be mentioned that the proposal of Taylor instability of the vapor-liquid interface made by Zuber and Tribus (references [1] and [2] of the discusser's paper[3]) on film boiling on a flat horizontal heating surface seems to be on much more solid ground, since in their case there should be very little induced flow field before the onset of instability.

The Inextensional Deformation of a Curved Panel[1]

ROBERT SCHMIDT.[2] What amazes the writer about this excellent paper is the simplicity of approach. However, anything that is simple and useful is great. If the work is first of its kind (and the writer harbors little doubt about this being so; he finds it difficult to believe, though, that the method of solution presented, as well as the closed-form solution for the complete cylindrical shell under equal and opposite diametral point loads, has not been subject to investigation by men other than Rayleigh), it opens an opportunity for further research in the inextensional theory of shells other than the circular cylinders. Of course, it should be added at this point that the inextensional theory has limited usefulness, as any theory would that disregards variations in curvature along the generators. This is obviously far from the truth, especially when the concentrated loads are close to the free curved edges. Nevertheless, the author should be encouraged to do additional research in the same general direction.

Author's Closure

The author is indebted to Professor Schmidt for his remarks. It is, of course, true that the inextensional method has limited usefulness, but it might be pointed out here that useful results can occasionally be obtained by combining the inextensional solution with approximate solutions obtained using other assumptions, an example being the analysis of the shearing of a curved panel with free ends.[3]

[1] By K. I. McKenzie, published in the December, 1963, issue of the JOURNAL OF APPLIED MECHANICS, vol. 30, TRANS. ASME, vol. 85, Series E, pp. 585–588.

[2] Professor of Engineering Mechanics, University of Detroit, Detroit, Mich.

[3] K. I. McKenzie, "The Shear Stiffness of a Corrugated Web," Aeronautical Research Council, R&M No. 3342, June, 1962.

Extension of a Method of Solution for Poisson's Equation[1]

ROBERT SCHMIDT.[2] The significance of the paper somehow escapes the writer. The three cases considered in the paper are amenable to simple inspection of the equation. Also, why should the metric tensor components and the superscripts be used when, in the case of orthogonal coordinates, the Lamé coefficients and the regular notation are preferable, since the authors are not making any use of the advantages of tensor properties or compact notation?

Moreover, [equations (19) and (21)], any Poisson's equation in two independent variables may be written in the form

$$(4\partial^2 g/\partial u\ \partial v) = F(u, v)$$

wherein u is a complex variable and v is its conjugate. This equation can be integrated directly to yield particular and general solutions.

Authors' Closure

Alternate mathematical methods for the solution of problems are continually sought, for often they provide new insight. What we present in this paper is such an alternate method, for the solution of certain problems involving Poisson's equation.

The use of such phrases as "obvious" and "simple inspection" are meaningless without definition. Any well-written article should make the content perfectly clear to the reader.

The criticism about our choice of notation is surprising. Notation is similar to taste in that the well-known Latin phrase "de gustibus non est disputandum" applies.

Lastly, we remark that the canonical form given by Professor Schmidt is indeed useful in a number of problems. However, the development of this form and the difficulties one can encounter adapting it to boundary conditions makes it desirable to have alternate methods.

[1] By M. H. Cobble and W. F. Ames, published in the September, 1963, issue of the JOURNAL OF APPLIED MECHANICS, vol. 30, TRANS. ASME, vol. 85, Series E, pp. 415–418.

[2] Professor of Engineering Mechanics, University of Detroit, Detroit, Mich.

The Unsteady Forces Due to Propeller Appendage Interactions[1]

Authors' Closure

Due to an oversight, the authors never received a copy of Dr. Breslin's comments on the above paper and were therefore unable to provide a closure to his discussion at the time that it appeared.[2] We are happy to do so now.

1 We do not feel that the substitution vortex concept represents more of a "retreat" from an attempt to take account of interaction than does the use of any rational approximation in cases where the exact solution to a problem is unobtainable. Essentially, the substitution vortex technique consists in replacing the disturbance potential of each of the bodies by the first two terms of its expansion in inverse powers of the distance, the coefficients in the truncated series being determined by the boundary conditions and the Kutta condition. Increased accuracy in taking account of interaction could have been achieved by retaining more terms in the foregoing series, but for our purpose, which

[1] By O. Pinkus, J. R. Lurye, and S. Karp, published in the June, 1963, issue of the JOURNAL OF APPLIED MECHANICS, vol. 30, TRANS. ASME, vol. 85, Series E, pp. 279–287.

[2] Discussion by J. B. Breslin, JOURNAL OF APPLIED MECHANICS, vol. 31, Series E, June, 1964, pp. 359–360.