than shell out-of-roundness. In the range $1 < p_m/p_y < 2$ we have obtained evidence that shell buckling can occur prematurely for internally framed cylinders when buckling is in the plastic range. We found the buckle lobes to be triggered by yielding of the shell induced prematurely by an initial deflection.

On the fourth point, the means cited for counteracting the detrimental influence of initial deflection have considerable merit. Preliminary experiments have been performed at the Model Basin using high internal pressure to plastically deform a cylinder to give favorable outward initial deflections. Results have indicated appreciable increases in strength (above 10 per cent).

In conclusion, we should like to add that a series of cylinders are now being tested, especially designed to study the influence of initial deflection. We expect to confirm the elastic deformations given by the theory and prove conclusively the existence of a difference in strength between internally framed and externally framed welded cylinders.

Buckling of Rectangular Plates With Two Unsupported Edges[1]

C. J. Thorne.[2] It seems desirable to call attention to the solution to this problem[3] and most of those in the author's previous paper referred to. The buckling condition was not graphed, but deflections and derivatives were plotted and special stability problems discussed in illustrative examples. This solution was for edge thrust and normal loads.

Author's Closure

The author wishes to thank Professor C. J. Thorne for calling attention to the paper[3] in which, as it seems to him, the solution to this problem[1] and the solutions to problems considered in my previous papers were discussed.

After studying this paper,[3] however, I did not find the solutions to my problems nor could I derive them from the solutions considered there. This is because an unfortunate mistake has been made in the basic boundary conditions. The boundary condition (8) on p. 4 is erroneous. The authors have used boundary conditions derived by Kirchhoff from energy considerations for a plate loaded by a lateral load only. If in addition to the lateral load there are forces acting in the middle plane of the plate, as in the paper,[3] the boundary condition (8) for unsupported edge should be written in the form:

$$\frac{\partial^3 w(x, b)}{\partial y^3} + (2 - \nu)\frac{\partial^3 w(x, b)}{\partial x^2 \partial y} - \frac{N_y}{D}\frac{\partial w(x, b)}{\partial y} - \frac{N_{xy}}{D}\frac{\partial w(x, b)}{\partial x} = f_6(x) \quad \ldots\ldots\ldots (1)$$

This boundary condition was first given in my degree thesis in 1936 and later was used in several of my papers[4−10] and in papers by other authors.[11] Due to the error in the boundary condition (8) the solutions of cases III, V, and VI are wrong. Cases I, II, and IV, the solutions of which are correct, have no relation to my problems. I could not expect Professor Thorne to have seen my papers in Ukrainian and Russian[4−7] before the publication of his 1952 paper.[3] It is unfortunate, however, that he had not noted that the boundary condition for an unsupported edge as put forward in my papers in English[8,9] is different from that given in his paper[3] before his contribution to this discussion had been made.

[1] By P. Shuleshko, published in the December, 1957, issue of the JOURNAL OF APPLIED MECHANICS, TRANS. ASME, vol. 79, p. 537.

[2] Code 5071, U.S. Naval Ordnance Test Station, China Lake, Calif.

[3] "Thin Plates Under Combined Loads, I," by F. E. Maud and C. J. Thorne, Studies in Applied Mathematics, No. 7, University of Utah, April 18, 1952.

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9 P. Shuleshko, "Buckling of Rectangular Plates Uniformly Compressed in Two Perpendicular Directions With One Free Edge and Opposite Edge Elastically Restrained," JOURNAL OF APPLIED MECHANICS, vol. 23, TRANS. ASME, vol. 78, Sept., 1956, pp. 359–363.

10 P. Shuleshko, "Buckling of Rectangular Plates With One Unsupported Edge," *The Journal of the Institution of Engineers, Australia*, vol. 29, Sept., 1957, pp. 215–218.

11 Y. V. Safronov and N. V. Bankovskaya, "Solution of the Problem of Stability of Rectangular Plates by the Method of Initial Parameters," *Applied Mechanics*, vol. IV, no. 1, 1958, pp. 61–69. (Ukrainian Academy of Science Press, Kiev.)

The Effect of Lubricant Inertia in Journal-Bearing Lubrication[1]

B. Sternlicht.[2] The authors are to be commended for their contribution to this field. The following comments are offered:

1 Averaging of the inertia over the film thickness $h(x)$ suggested by Slezkin and Targ (reference 2 of the paper) and used in this solution is not a very good assumption especially at high eccentricity ratios. The method employed by Kahlert (reference 4) would yield closer agreement between theory and practice. It would be worth while if the authors would compare the two results at high eccentricity ratio.

2 The authors state: "With the Reynolds number set equal to zero, Equation [7] reduces to the familiar Reynolds equation (which neglects inertia) as we would expect. If we let P_0 be the solution to this reduced equation and H_0 be the corresponding value of H, we can write for the solution of Equation [7]. . . ." This point may be misleading to the reader, for when the Reynolds number is equal to zero, there is no velocity and we cannot generate hydrodynamic pressures. It would be worth while to clarify this statement.

3 The Sommerfeld solution, Equation [14], yields the displacement to be perpendicular to the load direction. When inertia effects are included, this is no longer so and thus the eccentricity locus differs from the Sommerfeld solution. Please comment on this point.

4 In some of our recent work we found that under the laminar-flow conditions the effect of inertia on load-carrying capacity is negligible. However, the oil flow and temperature distribution are affected significantly when inertia is considered. It would be worth while if the authors in the section, "Discussion and Conclusions," would work out an example showing the load with and without inertia effects. No comparison of the flow can be made in this paper because the authors assume infinitely long bearing without side leakage.

[1] By J. F. Osterle, Y. T. Chou, and E. A. Saibel, published in the December, 1957, issue of the JOURNAL OF APPLIED MECHANICS, TRANS. ASME, vol. 79, pp. 494–496.

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