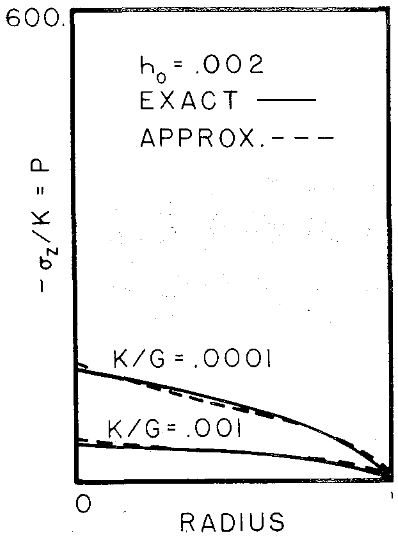

Fig. 16 Comparison of iterative numerical solution (exact) with approximate numerical solution for $h_0 = 0.002$

small separation, the rigid die analysis leads to a very far from accurate approximation if the dies (i.e., cylinder) are elastic. The method presented in the section titled Approximate Numerical Solution may be used along with Fig. 14 for an adequate solution. For cases in which Fig. 14 does not provide the desired information, then the Iterative-Numerical solution, employing the correction functions, must be used.

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DISCUSSION

B. Parsons[3]

This paper presents an interesting extension to the analysis of the compressive loading of a thin disk and could be of particular interest to those concerned with the press-forming of very thin shapes. The influence of the elastic deformation of the platens is shown to reduce the pressures applied to the disk over its central region to values which are practicable and not impossibly high compared with those predicted by the rigid theory. It must be acknowledged that this solution is for, what is in practice, the rather special case of a deforming mass of identical radial dimensions to those of the platens. A similar approach could, however, be applied to the cases where the plastic mass is smaller or larger radially than the platens and, of special interest to the friction specialists, to the case of a plastically deformed ring, as used in the friction tests of Male and Cockroft.[4]

The real merit of the paper, however, lies in the application of the author's results for the surface displacements on the end of a semi-infinite circular cylinder to real problems and, in this respect, the further application to the case of thin squeeze films should be even more useful.

Two minor technicalities are, the need to remedy the typographical error of equation (1), and the recommendation that in Figs. 7 and 10 the ordinate p should be given a false zero of unity.

W. R. D. Wilson[5]

The author has presented an analysis which will be of great value in predicting the pressure distribution in high-pressure anvil devices. It is interesting to compare his analytical predictions with the experimental work of Duecker and Lippincott.[6] These workers used an optical technique to determine the pres-

[3] Department of Mechanical Engineering, The University of Leeds, Leeds, England.

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[5] Lubrication Mechanics Division, Battelle Memorial Institute, Columbus Laboratories, Columbus, Ohio.

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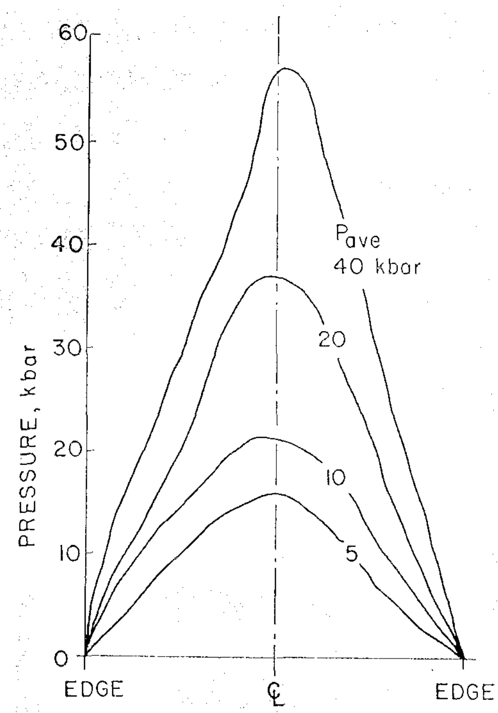

Fig. 17 Pressure distribution (Duecker and Lippincott)

sure distribution in a mixture of nickel dimethylglyoxine and potassium bromide compressed in an octagonal diamond anvil device. Fig. 17 shows some of the pressure profiles they obtained for various values of the mean pressure P_{avg}. It can be seen that the pressure magnification P_{max}/P_{avg} falls from about 3.0 at low pressures to 1.4 under high pressures. This is good qualitative agreement with the analytical prediction expressed in Fig. 11. A quantitative comparison would require a knowledge of the shear strength of the sample material.

Authors' Closure

The author thanks Dr. Parsons and Dr. Wilson for their discussions. Of particular interest is the figure provided by Dr. Wilson which when seen by the author made the effort of writing the paper seem worthwhile. It should be noted that the tabulated correction functions used in this paper will appear in the second issue of *International Journal for Numerical Methods in Engineering* under the title of "End Displacements of Semi-Infinite Cylinders Due to Annular Loadings."