Journal of APPLIED MECHANICS Discussion

Stress Analysis of a Helical Coil[1]

ROBERT SCHMIDT.[2] It is rather gratifying to see the fairly extensive numerical data, useful in the design of helical springs of rectangular cross section, presented in the paper.

The writer has noticed two trivial misprints in the paper; namely, a missing subscript in equation (21a) and the letter q instead of g in equation (29a). However, the most noticeable feature of the paper is the lack of references to the previous works dealing with the same problem.

The first solution for the "pure" torsion of a torus of rectangular cross section was given by Michell [1][3] in the form of a stress function similar to the author's. Tricomi [2] reconsidered the problem. Langhaar [3], only a few years ago, discussed and solved the problem again, presenting also a numerical example. His paper was published in this same JOURNAL. Sadowsky and Sternberg [4] discussed the history of the problem in a fairly complete manner.[4] In addition, the work of Liesecke [5] and a paper by Wahl [6] may be mentioned.

References

1 J. H. Michell, "Uniform Torsion and Flexure of Incomplete Tores," *Proceedings of the London Mathematical Society*, vol. 31, 1899, pp. 140-141.

2 F. Tricomi, "Su di un notevole caso di deformazione di una trave curva," *Atti, Reale Accademia delle Scienze di Torino*, vol. 73, part 1, 1937, p. 79.

3 H. L. Langhaar, "Torsion of Curved Beams of Rectangular Cross Section," JOURNAL OF APPLIED MECHANICS, vol. 19, TRANS. ASME, vol. 74, 1952, pp. 49-53.

4 M. A. Sadowsky and E. Sternberg, "Pure Bending of an Incomplete Torus," JOURNAL OF APPLIED MECHANICS, vol. 20, TRANS. ASME, vol. 75, 1963, pp. 215-226.

[1] By Irving Stein, published in the March, 1963, issue of the JOURNAL OF APPLIED MECHANICS, vol. 30, TRANS. ASME, vol. 85, Series E, pp. 122-126.

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[3] Numbers in brackets designate References at end of discussion.

[4] Equations (3) and the pertaining statement above them seem to be incorrect, in [4].

5 G. Liesecke, "Berechnung Zylindrischer Schraubenfedern mit rechteckigem Drahtquerschnitt," *Zeitschrift des Vereines Deutscher Ingenieure*, vol. 77, 1933, pp. 425-426.

6 A. M. Wahl, "The Calculation of Rectangular Bar Helical Springs," JOURNAL OF APPLIED MECHANICS, vol. 19, TRANS. ASME, vol. 74, 1952, pp. 119-122.

Author's Closure

The author appreciates the bringing to his attention the references given by Professor Schmidt. The "exact" solution of the helical coil stress problem was apparently done by Michell in 1899 and repeated (apparently unknowingly) by later authors. The simplifications to small index coils contained in the author's paper, however, do not appear to have been done before.

A Digital Computer Program for the General Axially Symmetric Thin-Shell Problem[1]

D. B. ROSSHEIM[2] **and C. A. HONIGSBERG.**[3] The authors have presented a useful summary of their development of a general computer program for thin shells of revolution subject to radially symmetric loading or temperature variation. Their success in the preparation of a generalized program of this type is a gratifying demonstration of the value of this approach to problems of heat transfer and stress analysis for shells.

The conclusion to the paper states that the program can be easily extended to include external rings, shell junctures, radial temperature variation, or concentrated loads. It would be inter-

[1] By W. K. Sepetoski, C. E. Pearson, I. W. Dingwell, and A. W. Adkins, published in the December, 1962, issue of the JOURNAL OF APPLIED MECHANICS, vol. 29, TRANS. ASME, vol. 84, Series E, pp. 655–661.

[2] The M. W. Kellogg Company, New York, N. Y. Fellow ASME.

[3] The M. W. Kellogg Company, New York, N. Y. Mem. ASME.