CORRECTION TO THE REVIEW "MATHEMATICAL THEORY OF CRACKS FORMED AS A RESULT OF BRITTLE FRACTURE"*

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In preparing a monograph on brittle fracture, I noticed that Eqs. (5.40) and (5.42) relating to the example of a crack in a strip subjected to equal and opposite concentrated forces a distance apart contained an error. The correct form of these equations is as follows:

$$\frac{P}{K\sqrt{L}} = \left(\frac{2}{\pi}\sin\frac{\pi l}{L}(1+\alpha^2)\right)^{1/2}\left[\operatorname{ch}\frac{\pi s}{2L} + \right.$$

$$\left. +\frac{(1+\nu)}{1+\alpha^2}\frac{\pi s}{4L}\operatorname{sh}\frac{\pi s}{2L}\operatorname{ctg}^2\frac{\pi l}{2L}\right]^{-1}. \qquad (5.40)$$

$$\frac{P}{K\sqrt{L}} = 2\left(\frac{1}{\pi}\cotg\frac{\pi l}{2L}\right)^{1/2}. \qquad (5.42)$$

This error is linked with the incorrect computation of the sums of a series in [1]. The correct equation for the stress distribution in this problem takes the form

$$p(x) = \frac{P}{2\pi}\left\{\left(\frac{\pi}{2L}\operatorname{sh}\frac{\pi s}{L}\right)\frac{1}{H} - (1+\nu)\frac{\pi^2}{4L^2}s\left(\operatorname{sh}\frac{\pi s}{L}\right)\frac{1}{H} + \right.$$

$$\left. +(1+\nu)\frac{\pi^2}{8L^2}s\left(\operatorname{sh}^2\frac{\pi s}{L}\right)\frac{1}{H^2}\right\}, \qquad H = \sin^2\frac{\pi x}{2L} + \operatorname{sh}^2\frac{\pi s}{2L}.$$

Moreover, in Eq. (5.10) a 2 was omitted from the numerator on the right side. It should also be noted that here, as in [1, 2], stress distributions corresponding to the plane state of stress were taken. The equations for plane strain are obtained by substituting $\nu/(1-\nu)$ instead of ν.

REFERENCES

1. G. I. Barenblatt and G. P. Cherepanov, "Effect of the boundaries of a body on the development of brittle-fracture cracks," Izv. AN SSSR, OTN, Mekhanika i mashinostroenie, no. 3, 1960.

2. G. I. Barenblatt, "Equilibrium cracks associated with brittle fracture. Straight cracks in flat plates," PMM, vol. 23, no. 4, 1960.