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The equations for the dynamic buckling of an axially impacted column are discussed. A method is presented for the calculation of approximate load and deflection variations in problems of high-velocity impact. The method may be extended for cases wherein the stresses exceed the elastic limit. Results of calculations are presented for two cases. In one of these, agreement with a previous exact solution is found to be good.
(Author's abstract)

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The problem considered is that of two bodies coming into normal contact over smooth curved surfaces. The initial relative velocity and the total kinetic energy involved is low. Contact is, however, confined to such small volumes of the objects involved that very high concentrations of energies are obtained at those places. The rates of application of stress are correspondingly high. The Hertz solution to this type of problem provides a useful approximation in the case of elastic objects.

In the present treatment one of the impinging bodies is of viscoelastic material. Two viscoelastic bodies may also be treated if they are of the same material. The Laplace transform method is used to obtain the viscoelastic expression for the force developed between the two surfaces. This expression is then applied to the impact case. The expression can also be applied to other truly static cases; e. g. , contact between gear tooth surfaces.

The results are of technological interest, since it is not possible to say if a plastic is suitable for a certain category of impact applications, unless the rates of straining or stressing obtained in those applications can be estimated. (Author's abstract)

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