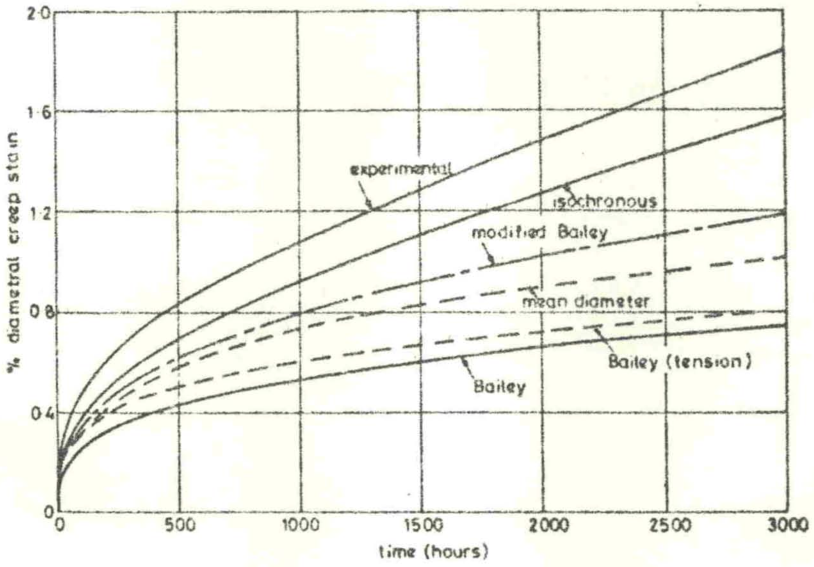

FIG. 22 COMPARISON OF EXPERIMENTAL AND THEORETICAL CREEP CURVES FOR CYLINDER (K=2) WITH INTERNAL PRESSURE 13 ton-f/in.^{2} (0.18 PERCENT CARBON STEEL AT 400°C)

small, but it steadily increases until for the 13 ton-f/in.^{2} pressure test there is a factor of 1.6 in the strains at 3,000 h between the two theories.

The isochronous approach gives the most consistent prediction of diametral strain over all the theories for this particular material always being within 20 percent of the experimental value. However, it must be realized that the assumption of a shear stress associated with a particular strain at any given time cannot be exactly correct if the stresses are varying with time, and it may be that this theory may not be as good for another material or for cylinders with a larger *k* ratio.

CONCLUSIONS

It would seem that, with the correlation between torsion creep and constant load tension creep data and also with the experimentally observed fact that the axial creep strain in a pressurized thick-walled cylinder is zero, that torsion creep data is more fundamental for designing cylindrical vessels under creep conditions.

It can be concluded that for the magnitude of creep strains involved in the experimental work reported in this paper, account must be taken of wall thinning of a thick-walled cylinder undergoing creep.

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