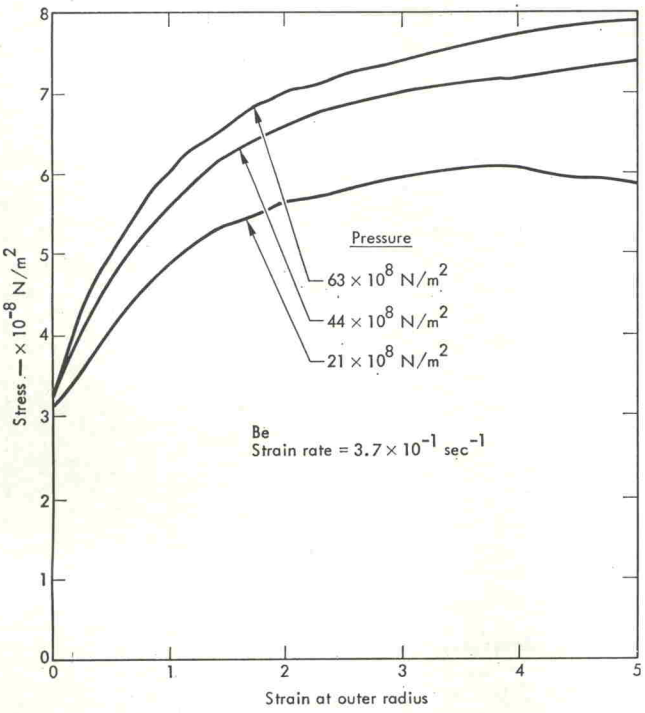

Fig. 3 (c) Stress-strain curve for Be at strain rate 3.7×10^{-1} sec^{-1}

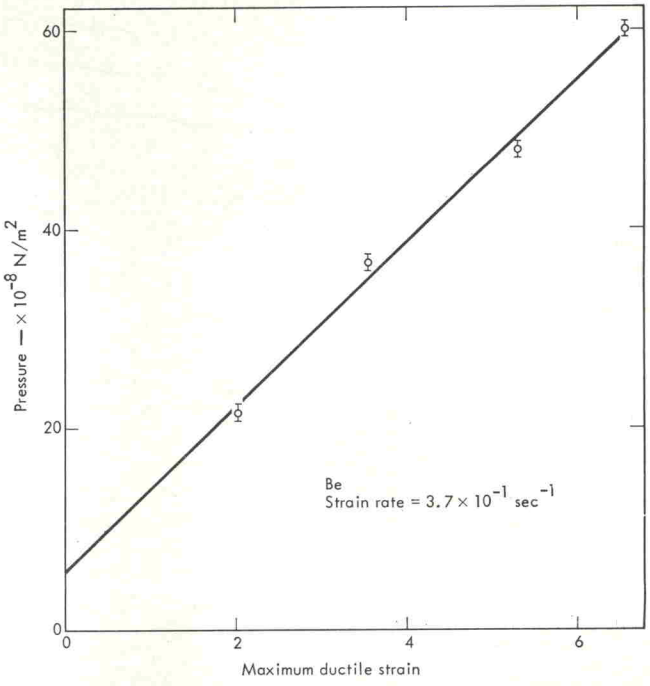

Fig. 5 Maximum ductile shear strain γ_D for the large strain Be data versus pressure

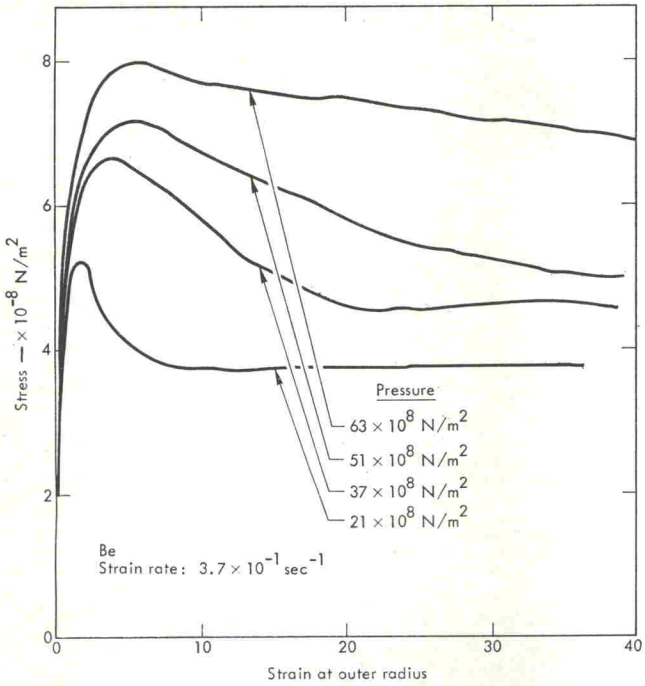

Fig. 4 Large strain Be data taken at 3.7×10^{-1} sec^{-1}

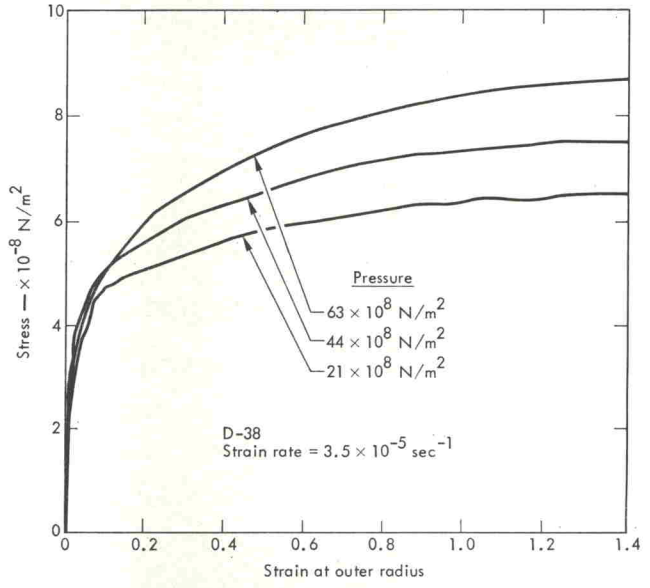

Fig. 6 (a) Stress-strain curve for D-38 at strain rate 3.5×10^{-5} sec^{-1}

Experimental Data and Discussion

In Fig. 3 the data for Be are shown. In Fig. 3(a) the data taken at a strain rate of 3.5×10^{-5} sec^{-1} are shown for the three pressures (21, 44, and 63 $\times$ 10^8 N/m^2) used in this work. In Figs. 3(b) and 3(c) the data for strain rates of 3.6×10^{-2} sec^{-1} and 3.7×10^{-1} sec^{-1} are given. As is seen in Fig. 3(c) the curve for a pressure of 21 $\times$ 10^8 N/m^2 shows a decrease in shear stress for strains larger than 3.8. The curves shown in Fig. 4 were taken at a strain rate of 3.7×10^{-1} sec^{-1} and at pressures of 21, 37, 51, 63 $\times$ 10^8 N/m^2. The total strain at the outer radius was increased to approximately 40. These curves show the shear stress increasing with strain up to some given value of strain, γ_D, after which the shear stress decreases with strain. The value of γ_D and the rate of decrease in shear stress are a strong function of pressure. When γ_D is plotted versus pressure as shown in Fig. 5, one can see that γ_D is zero for a pressure of 6 $\times$ 10^8 N/m^2. For pressures above 6 $\times$ 10^8 N/m^2, γ_D increases 1.2 for each 10^9 N/m^2 increase in pressure. For values of strain less than γ_D, the Be samples are believed to be deforming in a ductile mode. At γ_D the Be samples begin to break on a plane parallel to the shear direction. The break is of a more ductile nature at the higher pressures.

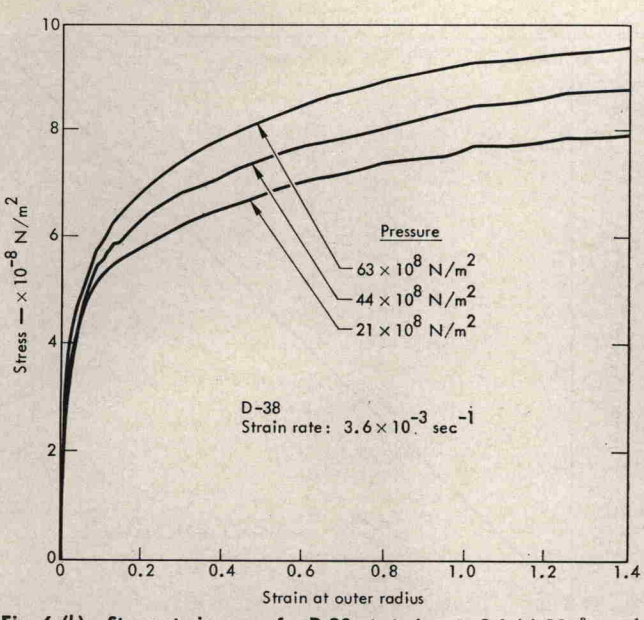

Fig. 6 (b) Stress-strain curve for D-38 at strain rate 3.6×10^{-3} sec^{-1}

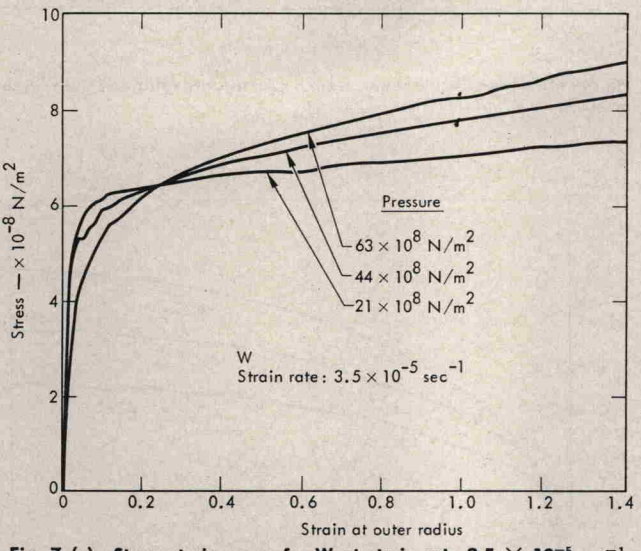

Fig. 7 (a) Stress-strain curve for W at strain rate 3.5×10^{-5} sec^{-1}

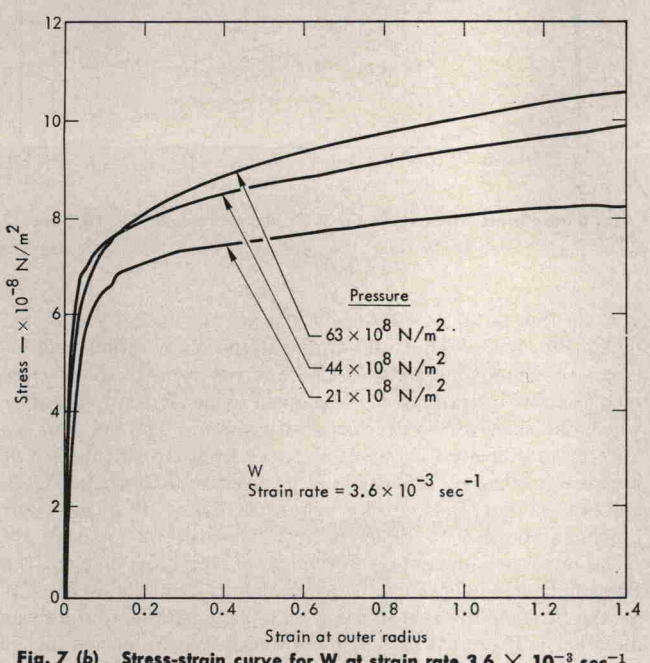

Fig. 7 (b) Stress-strain curve for W at strain rate 3.6×10^{-3} sec^{-1}

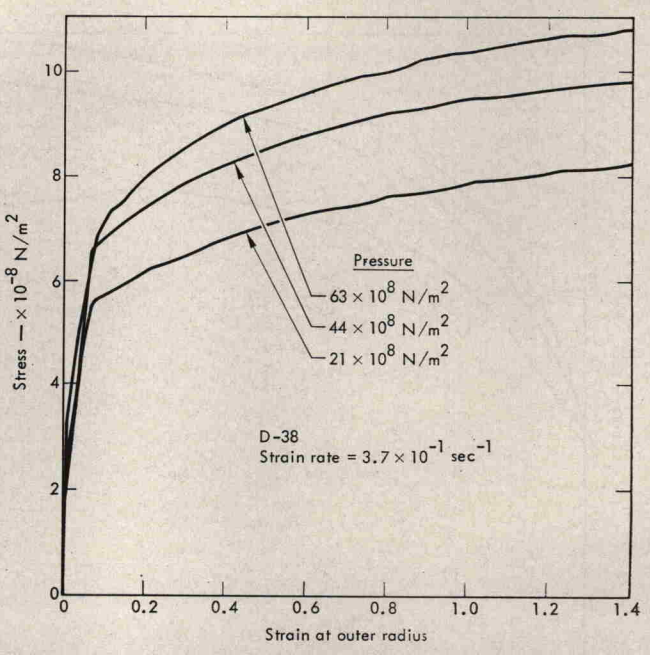

Fig. 6 (c) Stress-strain curve for D-38 at strain rate 3.7×10^{-1} sec^{-1}

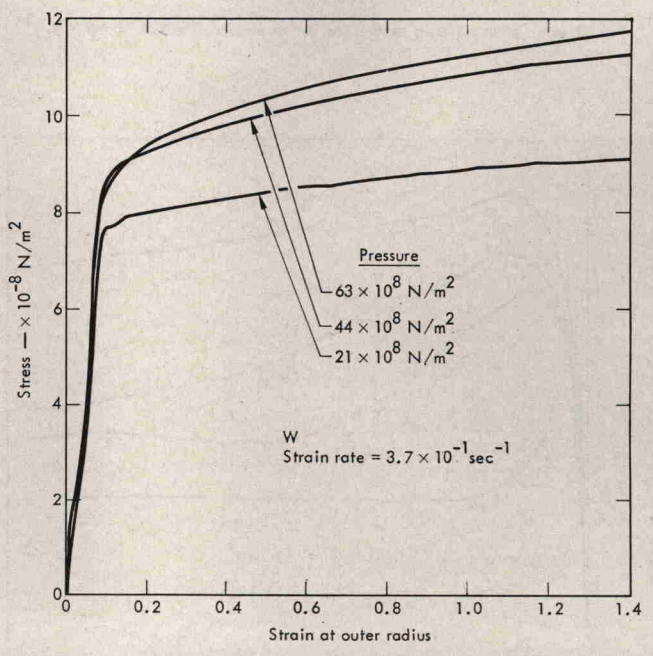

Fig. 7 (c) Stress-strain curve for W at strain rate 3.7×10^{-1} sec^{-1}

The samples used in these experiments were natural uranium with ^{235}U depleted, called D-38. The data for D-38 are shown in Figs. 6(*a*), 6(*b*), and 6(*c*) for the three strain rates. For both D-38 and W the low strain data, $\gamma < 0.05$, taken at the highest strain rate, 3.7×10^{-1} sec^{-1}, cannot be taken too seriously because our experimental technique has not yet been perfected for high strain rate, low strain data.

For tungsten the data, which is still somewhat preliminary, are shown in Figs. 7(*a*), 7(*b*), and 7(*c*). The most interesting of these curves are in Fig. 7(*a*) for a strain rate of 3.5×10^{-5} sec^{-1}. Here for strain less than 0.24 the strength appears to decrease with increasing pressure. If this is really the case and not an experimental idiosyncrasy, a theoretical explanation would be most interesting. For the other strain rates W shows an increase in strength with an increase in pressure for all strains even though there is some scatter in the low strain data.