

not known, however, so that it was necessary to explore with increasing stresses. As shown in Figures 4 and 5, at 1900 kg/cm², the creep rate decreased inversely with the time, indicating

for 200 minutes. Only elastic flow was observed, with the possible exception of perhaps 0.2 per cent pseudoviscous flow in the last 100 minutes. The stress was then raised to 3100 kg/cm² and

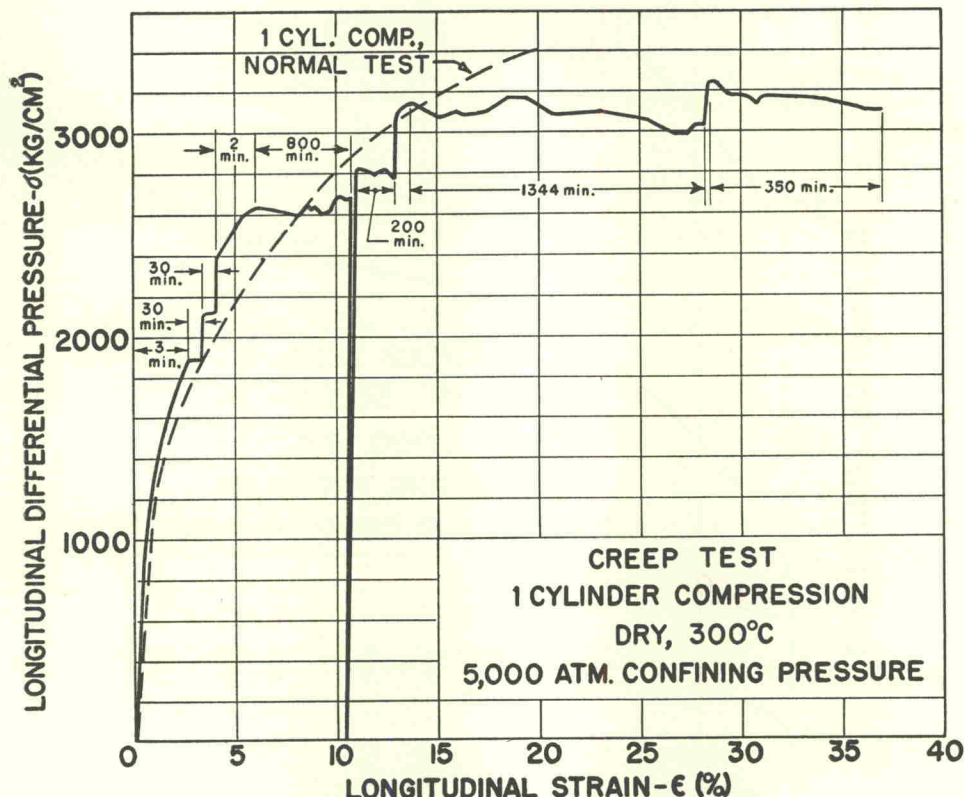


FIGURE 3.—STRESS-STRAIN CURVE OF EXPERIMENT 400

only “elastic” or recoverable flow. The same behavior was observed at 2100 kg/cm². At 2600 kg/cm², a substantial amount of “pseudoviscous” flow was apparent. The creep curve is obscure, however, because of inability to maintain the stress constant, as shown in Figure 3. After 800 minutes at approximately 2600 kg/cm², the stress was released to check the piston friction and reverse elastic or recoverable flow. Piston friction had increased an amount corresponding to 200 kg/cm² on the specimen. The applied stress therefore not only varied but is indeterminate to something like ±100 kg/cm².

When the stress was reapplied, the marble behaved elastically up to 2800 kg/cm² where the stress was again held relatively constant

maintained roughly for 1344 minutes or 22.4 hours. As shown in Figure 5, about 10 per cent of nonrecoverable flow ensued. Similar behavior was observed at about 3200 kg/cm² with a greater rate of flow. The deformation may be divided into the following categories:

	<i>Per cent</i>
Elastic strain.....	2
Plastic strain at the normal rate—.015 in. min.....	5
Elastic flow.....	8
Pseudoviscous flow at nearly constant stress.....	22
	—
Total.....	37

Thus the flow is of the type to be expected by intergranular motion or recrystallization.

It is a surprise to the writers that the applied stresses are so high for these rates of strain. It is conceivable that in these long-continued tests

plastic flow in these experiments was 3 per cent, under a super-imposed compressive stress of 14,400 kg/cm². This experiment was terminated

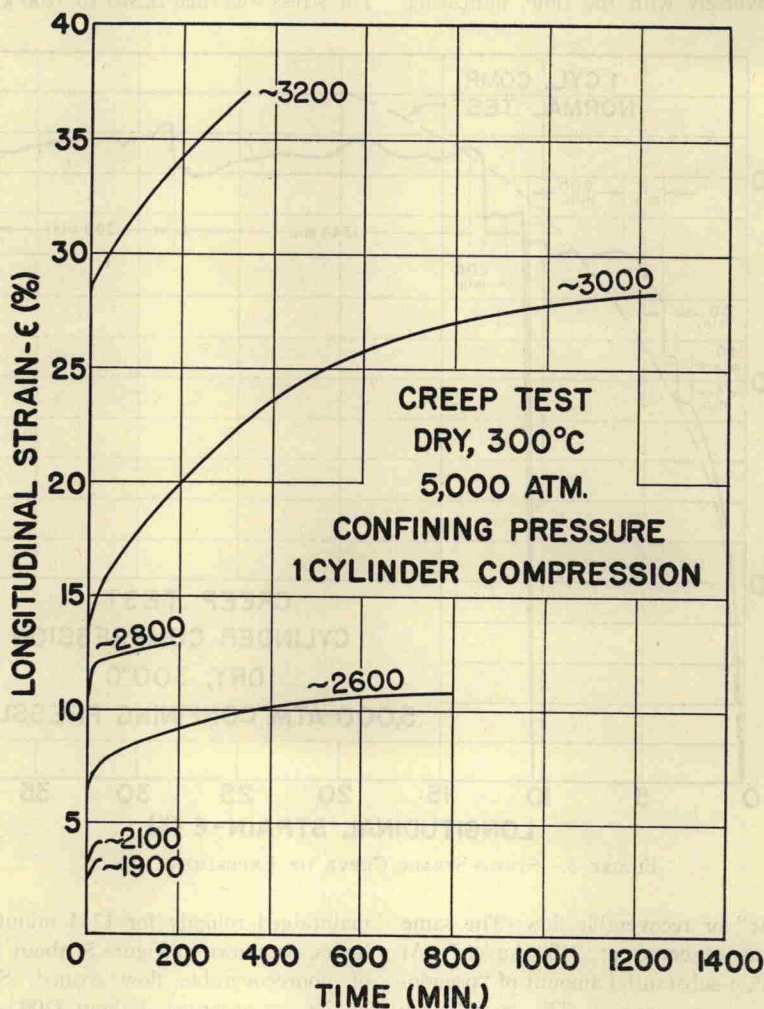


FIGURE 4.—STRAIN-TIME CURVES OF EXPERIMENT 400

the friction on the pistons rises to abnormally high values. This seems excluded, however, by the fact that a slight variation in the indicated load is promptly reflected in an appropriate change in the rate of creep. The fabric of this specimen will be described later.

Miscellaneous.—Westerly granite was deformed plastically at 300°C, dry, 500 atmospheres confining pressure. Several experiments indicate that the elastic limit under these conditions is about 10,500 kg/cm². The maximum

at the onset of shearing fracture. An excellent section was prepared by de Grossé. A zone of shear is evident, marked by slightly offset grains and a small amount of shearing of the micaceous minerals. Outside the zone of shear, the predominant visible effect is distributed fracturing of the grains and undulatory extinction. The section has the general appearance of a rock deformed at moderate depths where flow and fracture occur concomitantly. This and the nature of the stress-strain curves sug-