the higher coefficient of viscosity at atmospheric pressure at any temperature will likewise have the greater coefficient under pressure. While the viscosities of the fractions, oils 3, 5 and 6 increased uniformly with the molecular weights, those of the commercial oils did not, a result that indicated that the relation between viscosity and molecular weight is of significance only when fractions of a narrow boiling range are used.

Table III contains computations of the mean temperature coefficient of viscosity, calculated over the range 100° to 210°F from the pressure data.

While the viscosity index at atmospheric pressure of these oils did not seem to be directly related to the viscosity at various pressures and

TABLE II. *Viscosities at atmospheric pressure (centipoises).*

Oil Number	100°F		210°F	
	Capillary Pipette	Rolling Ball	Capillary Pipette	Rolling Ball
1.	406.00	415.00	25.90	26.05
2.	34.40	34.05	4.82	4.90
3.	26.20	26.90	4.01	4.33
4.	23.40	23.00	3.75	3.87
5.	20.00	19.65	3.62	3.54
6.	14.20	14.45	2.70	2.87

TABLE III. *Mean temperature coefficient of viscosity 100°–210°F.*

Oil No.	14.2 lb./in.²	10,000 lb./in.²	18,000 lb./in.²	30,000 lb./in.²	Molecular Weight	Viscosity (centi-poises) 100°F	210°F
1.	0.00850	0.00870	0.00890		706	415	26
2.	.00778	.00812	.00835		368	34	5
3.	.00762	.00810	.00829	0.00852	370	27	4
4.	.00757	.00796	.00803	.00844	352	23	4
5.	.00745	.00777	.00796	.00848	342	20	4
6.	.00730	.00764	.00794	.00828	310	14	3

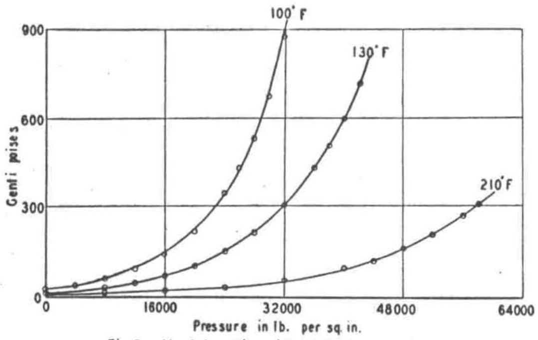

Fig. 5 Absolute Viscosity vs. Pressure - Oil No. 5

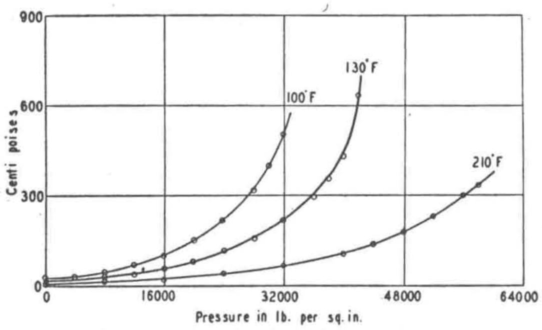

Fig 6. Absolute Viscosity vs. Pressure - Oil No. 6

temperatures, the mean temperature coefficient of viscosity did seem to be related to the molecular weight, both increasing together with increase of pressure. For each oil, it was found that the temperature coefficient of viscosity increased with pressure as shown in Table III, a result which is normal for pure liquids.

These studies are being continued at present with the intention of mapping in greater detail the viscosity characteristics of lubricating oils over a wide range of experimental conditions. In conclusion, the authors acknowledge the interest and cooperation of Dr. M. R. Fenske. They are indebted to the Pennsylvania Grade Crude Oil Association for partial support of this program.