

from the heater in the pyrophyllite. Readings from this thermocouple are shown in Figure 29. It is apparent that there is a very large temperature drop through the pyrophyllite.

All runs made with the geometries shown in Figures 27 and 28 are recorded in Table 9. There is considerable scatter in the data as can be seen from the table. The standard deviation is about ± 5 per cent of the temperature over the range measured. Pressure effects of the EMF of Pt-Pt-10 per cent Rh thermocouples have been measured (40), (41) but the corrections are less than the scatter of the data so these corrections were not applied. The average values obtained from all runs are plotted in Figure 30. These values were fitted to quadratic equations by the least squares method and the equations were used to extrapolate to higher values than could be obtained from the actual thermocouple readings. The equations used were:

Oil Pressure

$$1000 \text{ psig } \quad ^\circ\text{C} = 9.3 + 3.374(\text{watts}) + 0.0003625(\text{watts})^2$$

$$3000 \text{ psig } \quad ^\circ\text{C} = 19.2 + 2.983(\text{watts}) + 0.0007060(\text{watts})^2$$

$$5000 \text{ psig } \quad ^\circ\text{C} = 40.0 + 2.393(\text{watts}) + 0.001763(\text{watts})^2$$

$$7000 \text{ psig } \quad ^\circ\text{C} = 54.6 + 2.172(\text{watts}) + 0.002042(\text{watts})^2$$

The samples were heated by passing alternating current at high amperage, low voltage through the graphite heater. Readings could be obtained from the thermocouples without any AC interference until a temperature at which