was previously spot-welded to the side of the tantalum tube. This entire assembly was then inserted into the hole in the tetrahedron with the thermocouple wires running out the tetrahedron, perpendicular to the tantalum tube, through one of the edges of the tetrahedron and through the protective sheaths described previously. A steel tab (see Figure 4) was then placed over each end, and the pyrophyllite edges that were sliced off were glued back in place. Now the heating current will pass through the two anvils and the steel tab on one end, through the lead and tantalum core and out the other end through the steel tab and anvils. Since this small sample has a rather high resistance, it will serve as its own I^2R heater.

With this tetrahedron in the press and the thermocouple wires running through a cold junction to the recorder, we can measure the temperature inside the tetrahedron as the current through the sample is increased.

Melting Point Detection Method:

It was possible, with the geometry described above, to observe a very sudden rise in the temperature of the sample when it melted. This effect, which can be seen in the reproduction of the strip-chart recorder chart in the Appendix, has been explained this way: When the sample melts, the resistance rises sharply and, since the resistance of the entire heating circuit was large compared to the sample resistance, no appreciable change in the total current through the circuit was effected; however, the I^2R heating of the sample rose sharply as the resistance of the sample rose. Consequently, the temperature of the sample would rise sharply also.