The Standard Graphite Pile at Argonne: (Leo Seren)

Standardization measurements on a 5' AGNT column were completed. The density of the graphite was 1.6146 grams/cm^2. The diffusion length was taken to be 49.73 cm. The indium foils which were standardized were 4 x 6.5 cm^2 and of weight 2.400 grams. They were measured on our counter set Daleth. Ra + Be sources IV and V were used and their strength was taken to be 11.9 x 10^6 neutrons per second by comparison with sources I and III. The resonance activity was measured and is described by means of the equation

$$A(CdInCd) = 24,672e^{-(z/28)^2} + 11,586e^{-(z/40)^2} - 957e^{-(z/60)^2} \qquad (1)$$

which gives the In resonance activity in counts per minute. The percentage of each range is given in Table II

Table II

Fraction	In Range cm	Thermal Range cm
.3633	28	32.6
.4974	40	43.3
.1393	60	62.2

From this data the thermal neutron density was calculated along the lines given in CPA-6. The results were:

for the slowing-down density -

$$q_{In} = 0.00143\ (CdInCd) \quad \text{neutrons/cm}^3\text{/sec} \qquad (2)$$

and for the thermal neutron flux -

$$nv = 0.102\ (In - 107CdInCd) \quad \text{neutrons/cm}^2\text{/sec} \qquad (3)$$

The quantities of (CdInCd) and (In) represent the saturated activities in counts per minute as recorded on the counter set Daleth. In the equation (3) a mean free path of 2.71 cm was used. A more complete report describing these measurements more in detail is forthcoming.

Interference Effects with Thermal Neutrons: (Anderson, Fermi, and Woods)

On top the Argonne pile there is a thermal purification column made of graphite 5' x 5' and 31 layers high above the lattice. Attempts were made to measure the boron cross section for the neutrons emerging from the top of this column. The results obtained was 522 cm^2/mole, which is considerably larger than the value 464 cm^2/mole previously obtained. This indicated that probably the lower energy neutrons penetrated more readily through large thicknesses of graphite than do the neutrons in the higher energy part of the Maxwell distribution. Further experiments indicated that