It may be noted from Table I that the calculated rate at 1800 m.w.e. is below the limit set by the present 1000-gallon experiment. However it is clear that a large scale experiment would have to be performed at a much greater depth. If the proposed experiment were conducted in a mine approximately 4500 feet deep (4000 m.w.e.) the muon produced Ar^{37} would be a factor of 30 below the expected rate of 4 to 11 per day from solar neutrinos.

Ar^{37} may also be produced in the liquid by energetic neutrons. Neutrons having an energy above 0.97 MeV will produce protons by the exothermic $Cl^{35}(n,p)S^{35}$ reaction with sufficient energy to produce Ar^{37} by the $Cl^{37}(p,n)Ar^{37}$ reaction. This effect was evaluated by irradiating the liquid with a Pu-Be neutron source. These measurements gave a yield of one Ar^{37} atom per 1.4×10^{6} neutrons absorbed. Fast neutrons from the surrounding rock could produce one Ar^{37} atom per day if the neutron flux on the surface of the 100,000-gallon tank (26 ft diameter x 26 ft high) were 4×10^{-4} neutrons cm^{-2} min^{-1}. The fast neutron flux may be kept below this value by a water shield, the thickness depending on the uranium and thorium content of the rock wall.

Internal contaminations leading to Ar^{37} production in the materials of the tank or the liquid itself cannot be shielded out, and would serve as an inherent background that could not be separated from a neutrino signal. We have, however, found that the thorium and uranium content of perchlorethylene was less than 2×10^{-9} gm per gram. At this level internal neutron production is unimportant, less than 0.01 Ar^{37} would be produced per day by these neutrons. However, even at this uranium and thorium level the sulfur content must be below 0.5 percent to reduce the Ar^{37} produced by the $S^{34}(\alpha,n)Ar^{37}$ reaction to less than one per day.

We may conclude from the above considerations that an experiment using 100,000 gallons of pure perchlorethylene in a mine 4500 feet deep,