it is clear that an improvement in sensitivity by a factor of five would be required to observe neutrinos from Be^7 decay in the sun, and an increase in sensitivity of over ten is required to observe neutrinos from the H(He,ν)D reaction if this is the only source of solar neutrinos.

The sensitivity of the present experiment is limited by various background processes that produce Ar^{37} in the tank. The most serious background effect is from cosmic ray muons. Protons produced by cosmic ray muon interactions form Ar^{37} in the liquid by the $Cl^{37}(p,n)Ar^{37}$ reaction. The Ar^{37} production rate from this process as a function of the depth underground was estimated from measurements performed at 25 m.w.e., the decrease in the muon intensity with depth, and the increase in the cross section for nuclear interaction of muons with depth. This rather crude analysis indicated the cosmic ray muon production of Ar^{37} at a depth of 4400 m.w.e. is 0.1 atom per day.[13] The study of the production of neutrons by nuclear interactions of muons underground of Ryajsicaya and Zatsepin[14] would indicate the background at this depth would be 0.06 Ar^{37} atom per day. Professor Wolfendale[15] kindly estimated the background effect from fast muon interactions, and found also an Ar^{37} production rate of 0.06 day^{-1}. These analyses are based upon an Ar^{37} production rate of 6500 day^{-1} in 3.8×10^5 liters tetrachloroethylene at a depth of 25 m.w.e., and they assume the muon interactions vary with depth as $I\bar{E}^{0.7}$, where I is the total muon intensity and $\bar{E}$ is the average muon energy. In view of the long extrapolation from the measurements at 25 m.w.e. to a depth of 4400 m.w.e., the estimated muon background effect is not very accurate. Experiments are in progress with a 16,000 liter detector that may be set at various depths in the mine. A single measurement was performed at a depth of approximately 800 m.w.e., and the Ar^{37} production rate was found to be less