IMG 2272 - A Moving Boundary Transport Apparatus built by Andy Gordon and Frank Wetmore in the 1930s-1940s?. [Review of methodology McGuiness and Longsworth, Chem Rev., vol11, p171 (1932); AR Gordon, Ann. Rev. Phys. Chem., vol 1, p59-74 (1950)].

This was used to measure directly transport numbers in electrolyte solutions. Using the glass taps at the bottom, one could introduce both the electrolyte of interest and a subsidiary one, to occupy a U-shaped tube (including the narrow tubing with tiny electrode pairs). Providing the subsidiary solution had one ion in common with the test solution, and the remaining ion of the subsidiary was chosen sensibly, passage of a current through the U would force a stable boundary between the two solutions. Furthermore the boundary necessarily moved along the tube at a rate which depended on the proportion of the current carried by the common ion, thus allowing direct measurement of the transport numbers by finding the rate of motion of the boundary. Often the boundary was clear enough to the naked eye to measure its rate very well. In this particular setup the conductivity of the solution between the electrodes at each station along the tube was measured over time. This changed rapidly as the boundary passed through, allowing the boundary's velocity to be measured, and thus the transport numbers.

This equipment was used to measure ion transport numbers and the boundary between the two ion solutions was clearly visible and its position could be measured.under different conditions.

It is believed that this particular apparatus came from Professor D. J. LeRoy's lab. He had students doing such measurements in the '50s. Professor Valleau’s mentor, Frank Wetmore, may very likely also have published such numbers, perhaps done with Dr Axel Lasson.

We are grateful to Professor John Valleau for providing this information.