around the accumulator and groundwater passed through the column for a period of four months for a total flow volume of about 6 L of groundwater.

At the termination of the migration experiment, the column was removed from the anoxic chamber in the URL to recover the column material. The column was frozen, and the frozen column material was sliced into 1 cm-long sections. These samples were dried and analyzed by gamma spectrometry.

Approximately 1.5 g of the column material was taken from the fraction of the column material adjacent to the inlet and added to a separatory funnel to separate into four fractions for mineralogical investigation. 50 mL of tetrabromoethane, a heavy liquid with a density of 2.96, was then added to the funnel. Some of the darker (mafic) minerals settled to the bottom of the separatory funnel and these were drawn off, dried, and weighed and denoted Fraction a. A few drops of acetone were then added to the mixture in the separatory funnel to decrease the density of the liquid until the remaining dark minerals settled out as Fraction b. Additional acetone was added dropwise until a large fraction of the lighter coloured minerals settled out (Fraction c). Finally, the remaining mineral fraction was also drawn off, dried and weighed (Fraction d).

Batch sorption experiments with technetium were performed in the anoxic chamber in a surface laboratory in an O_2 concentration of <0.5 ppm on fractions of the same crushed and wet-sieved granite as was used in the column migration experiments. Individual contacting solutions containing ^{99}Tc were prepared using groundwater from the URL. The initial radionuclide concentration was 1.92×10^{-6} mol/L. The batch experiments were carried out in triplicate with a solution volume to solid weight ratio of 3:1. Samples were taken for radiometric assay after 1, 2, 4, 9, 16, 32 and 52 weeks.

TECHNETIUM RETAINED IN THE COLUMN

The nearly symmetrical shape and the complete breakthrough (relative concentration = 1) of the tritium curve was observed during the first of week column operation. This suggests excellent flow stability in the column with no evidence of significant channeling. Only about 7 % of the injected technetium was recovered from the tritium breakthrough region. The maximum value of the relative technetium concentration in these eluent fractions was 0.086. After tritium breakthrough, no further technetium was observed in the eluted groundwater over the four months. As a results, almost all of the injected technetium was retained in the column.

Radiometric results obtained on sliced fractions of the column material showed that most of the technetium remained firmly fixed in the first 0.5 cm in the column (Fig.1).

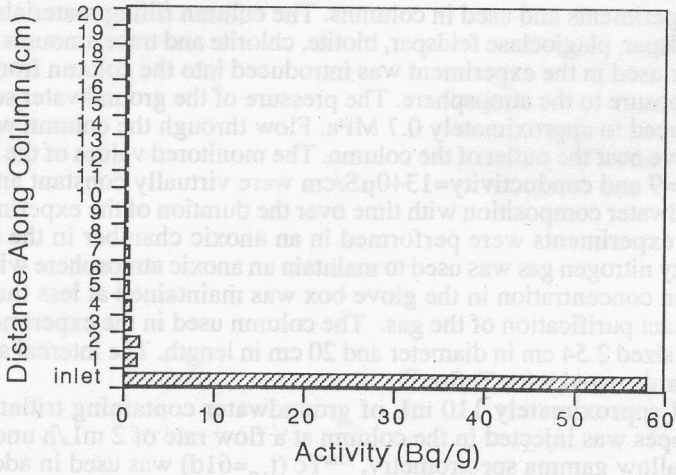

Fig.1 Distribution of ^{95m}Tc in the column after more than four months of continuous elution.