The leaching problem is vague and ill-defined. Calcium sulphite and sulphate are relatively innocuous but regulatory authorities express concern about the leaching of metal compounds (selenium, arsenic, mercury, and others) from the residual fly ash collected in the scrubber and present in the sludge.

f) Flue Gas Desulphurization -- Recovery Processes

Recovery of the SO_2 in power plant flue gases as a useful material has been a research goal for several decades. Numerous companies have seen this as a promising business venture and have expended large sums in development. Various agencies and institutes have also taken part, including TVA, EPA, DOE, and EPRI in the U.S., Bergbau Forschung in Germany, and various groups in Japan.

The results of all this work have not been very promising. In Japan there are only four installations on utility boilers, totalling a little over 500 MW. There are also about 25 units on industrial boilers and other industrial operations with a total gas flow equivalent to about 2 500 MW. In the U.S., two utilities have installed recovery processes on a commercial basis; the total capacity is about 2 500 MW.

Process Description: There are dozens of recovery processes, in various stages of development. Only the more significant ones will be summarized.

- Wellman-Lord. The gas is scrubbed with sodium sulphite solution and the resulting sodium sulphite-bisulphite heated to evolve a rich stream of SO_2, convertible either to sulphuric acid or elemental sulphur. The process is used by New Mexico Public Service and NIPSCO in the U.S., and by Chubu Electric in Japan.

- Magnesia scrubbing (Chemico, United Engineers). The gas is scrubbed with MgO slurry to form $Mg(HSO_3)_2$ which is then treated with MgO to precipitate $MgSO_3$. The sulphite is dried, calcined to evolve a rich stream of SO_2, and the SO_2 converted to sulphuric acid. Philadelphia Electric is installing the process at two stations and TVA plans an installation at the Johnsonville station.

- Rockwell. Sodium sulphite produced in a spray drying process is reduced to sodium sulphide in a furnace and the resulting melt treated with water and carbon dioxide to evolve a rich stream of H_2S, convertible to sulphur by the Claus process. The method has the advantage that coal can be used as the reducing agent whereas the other methods require either natural gas or expensive activated carbon. The process is being tested in a 100 MW facility at Niagara Mohawk's Huntley station.