ment many of the recommendations of the Panel on Seismic Improvement, of which Lloyd Berkner was chairman. Last year that panel concluded that this country's seismological research should be greatly expanded immediately and proposed a number of important programs, yet the executive branch has not asked for funds to support such work.

Other Aspects Examined

Senator Humphrey put forward still another aspect of the problem in his analysis of the test-ban issues when he urged that the principle of deterrence, the concept underlying other United States defense policies, be applied to the nuclear test control problem. He commented:

"We must accept the fact that we cannot cover every little unidentified event in the Soviet Union to see whether it is an earthquake or a nuclear test. We can, however, demand the right to inspect a certain number of cases on the assumption that such inspections will constitute a spot check system of random sampling which will have a high probability of accuracy and which will deter a nation from thinking a few sneak tests can be held without being caught."

Humphrey emphasized that new scientific data do not preclude the realization of a workable agreement. He pointed out that the scientific problems that have developed during the course of the negotiations in Geneva are not substantially different from those the negotiators faced when the meetings began. He said:

"We knew then that although our techniques of detecting and identifying tests would improve with increased research and knowledge, we would also discover a larger number of natural phenomena with this newer and more sensitive equipment.

"Nothing has changed since last October that justifies our giving up."

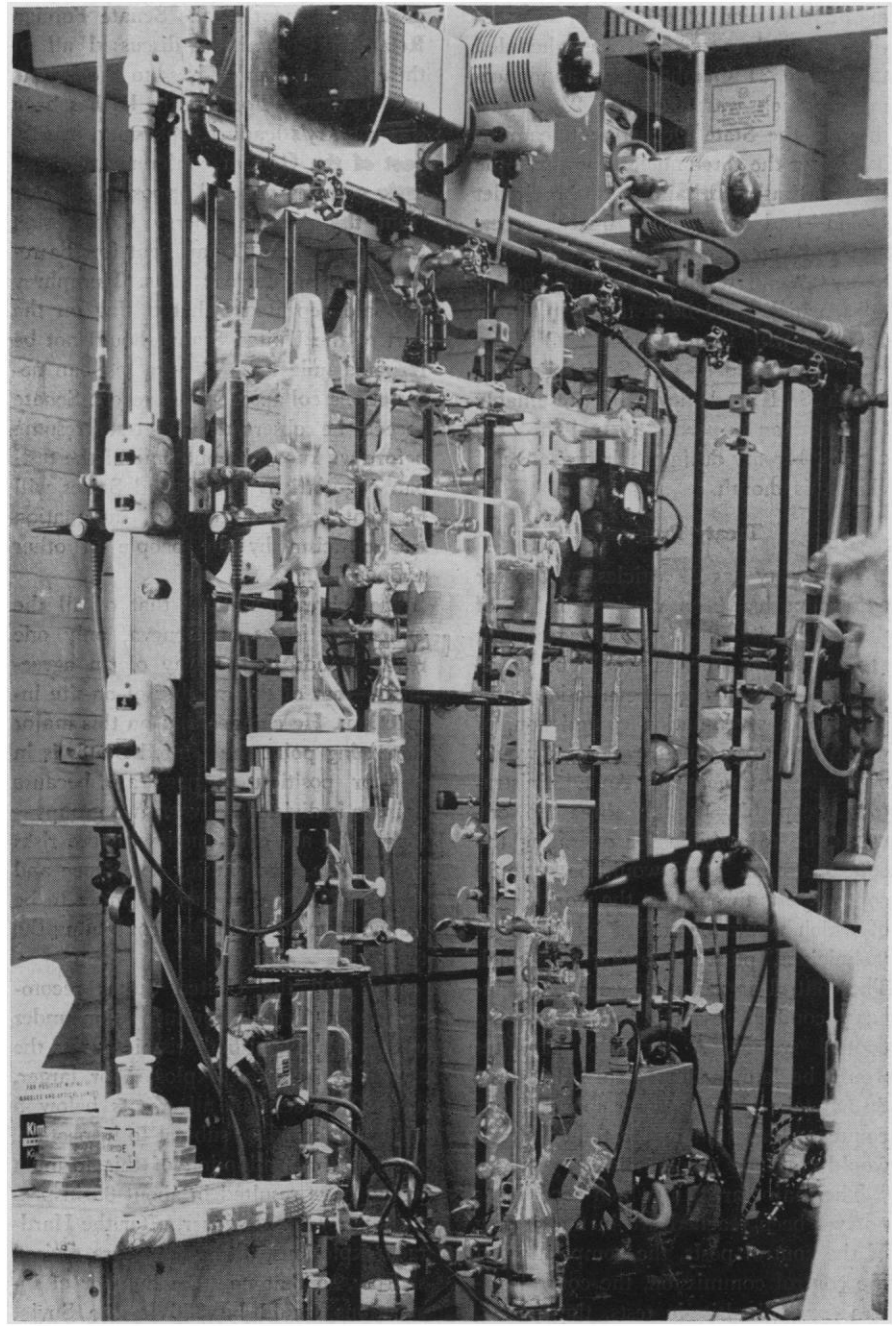
Hydrogen Isotope Studies Applied to Geology

The movement of water in cosmic scale processes and its geochemistry are current projects of the Geochemistry and Petrology Branch of the U.S. Geological Survey. By mass spectrometry, researchers in the nucleonics group are determining the ratios of light to heavy hydrogen in clouds, surface waters, glaciers, rain and snow, and the rocks of the earth's crust in an attempt to learn the earth's past and present water circulation and migration.

Water sometimes takes thousands, even millions, of years to complete the hydrologic cycle from ocean to cloud, to land, to ground water, to surface water, and back to the sea. And in the sea itself there are also known to be large time factors involved in the mixing of the various layers of ocean water and for exchanges with the atmosphere.

Congressional Report Says Current Fallout Not Hazardous but Warns against Test Resumption

On 24 August the Joint Committee on Atomic Energy released a "Summary-Analysis" *of hearings on weapon-test fallout that were held in May before the Special Subcommittee on Radiation. The 42-page report is reassuring about the fallout hazard from past nuclear tests but warns against resuming testing at the level of intensity of the last 5 years. The committee's analysis also points out that*



A U.S. Geological Survey geologist preparing a sample of atmospheric water for hydrogen isotope analysis.