FIELD MEASUREMENTS OF WATER MOVEMENT 
THROUGH A SILT LOAM SOIL

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A KNOWLEDGE of the rate at which water moves through undisturbed soils after they have been wetted is of much significance in practical agriculture as well as in engineering problems concerned with soil mechanics and underground water. Many investigations have been made for the purpose of measuring the amount of water stored in field soils after being wetted. So far as the authors know, however, no long-continued sequence of measurements, in which evaporation and transpiration were prevented, has been made on undisturbed soil for the purpose of determining the magnitude of the vertical flow across various horizontal planes. The experiment here reported had this as its principal objective.

Israelsen and West (4) have published results from plots which had been heavily irrigated and covered with straw to retard evaporation. Their two sets of measurements indicated a comparatively rapid movement immediately following irrigation.

Veihmeyer and Hendrickson (7), working in the Sacramento Valley where no rain fell during the growing season, presented the results of wetting to about 6 feet a soil which had been previously dried by a grain crop. Under these conditions, there was present at all times a zone of dry soil below that wetted by the irrigation. No plants were allowed to grow after irrigation. They found very little movement during the interval between the fifth and sixty-first day after irrigation.

Blaney, Taylor, and Young (1) reported a series of moisture records on a plot of ground which had been irrigated and then covered to prevent evaporation. The tests were made over a period of 14 months and indicated a decreasingly slow downward movement during this period.

Several experiments have been conducted by the authors since 1932 with soils on the University Farm at Davis, Calif., to determine their behavior, in situ, with respect to downward water movement after irrigation. The present results are representative of these experiments and have the advantage of accumulation over a longer continuous period upon a more uniform soil type than any of the other experiments which were undertaken. They were carried out on a silt loam soil of the Yolo series during a period of 842 days from October 1934 to January 1937.

The Yolo series consists of recent, secondary soils which have formed upon deep, valley sediments derived from sandstones and shales. They lack the conspicuous horizon differentiation associated