

EVAPORATION FROM WATER SURFACES AND RIVER-BED MATERIALS*

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THE experiments described below were made at the Irrigation Field Laboratory at Denver, Colorado.

The work was commenced in 1915 and continued for over one year.

The first series of experiments was to determine the difference in rates of evaporation from tanks of varying diameters. Thin-metal circular tanks were used, set in the ground so that the top of the tank was 3 ins. or less above the ground-surface. Taking the rate of evaporation from a tank 12 ft. diam. as 100, the rates of evaporation from smaller tanks were found to be as follows: 1-ft. tank, 155; 2-ft. tank, 129; 4-ft. tank, 118; 6-ft. tank, 110; 9-ft. tank, 101.

The second series of experiments dealt with the relative evaporation from square and from circular tanks. The rate of evaporation from square tanks was found to be from 103 to 105 per cent. of that from circular tanks of the same area.

Experiments to determine the effect of depth of water in the tanks upon the rate of evaporation showed greater evaporation in summer from shallow tanks than from deep tanks, and that the reverse was the case in the fall. This difference was relatively small for tanks more than 2 ft. deep.

differences of temperature, the rate of evaporation from the flowing water was found to be about 8 per cent. greater than from the still water. The surface-velocity of the flowing water was from 0.52 to 1.25 ft. per second. No definite relation between rate of evaporation and velocity could be established.

Fig. 1 shows the results of the experiments to determine the effect of temperature upon evaporation. Tem-

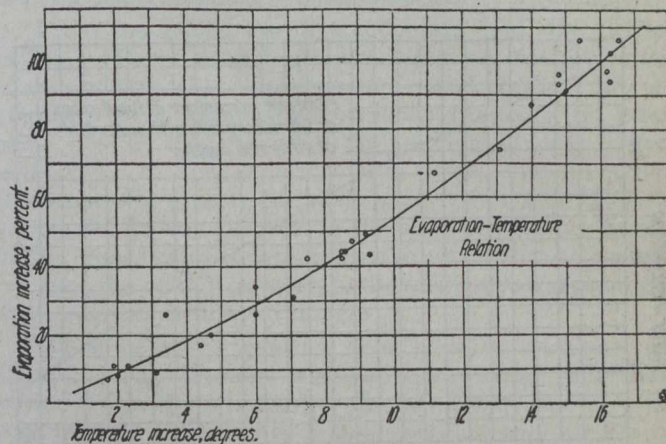


Fig. 1.—Relation Between Temperature and Evaporation

peratures are given in degrees Fahrenheit. The temperature given is that of the water-surface, and was taken by means of floating thermometers. In this connection temperature readings of the air and the water at different depths are of interest. On a warm day in March, the air-

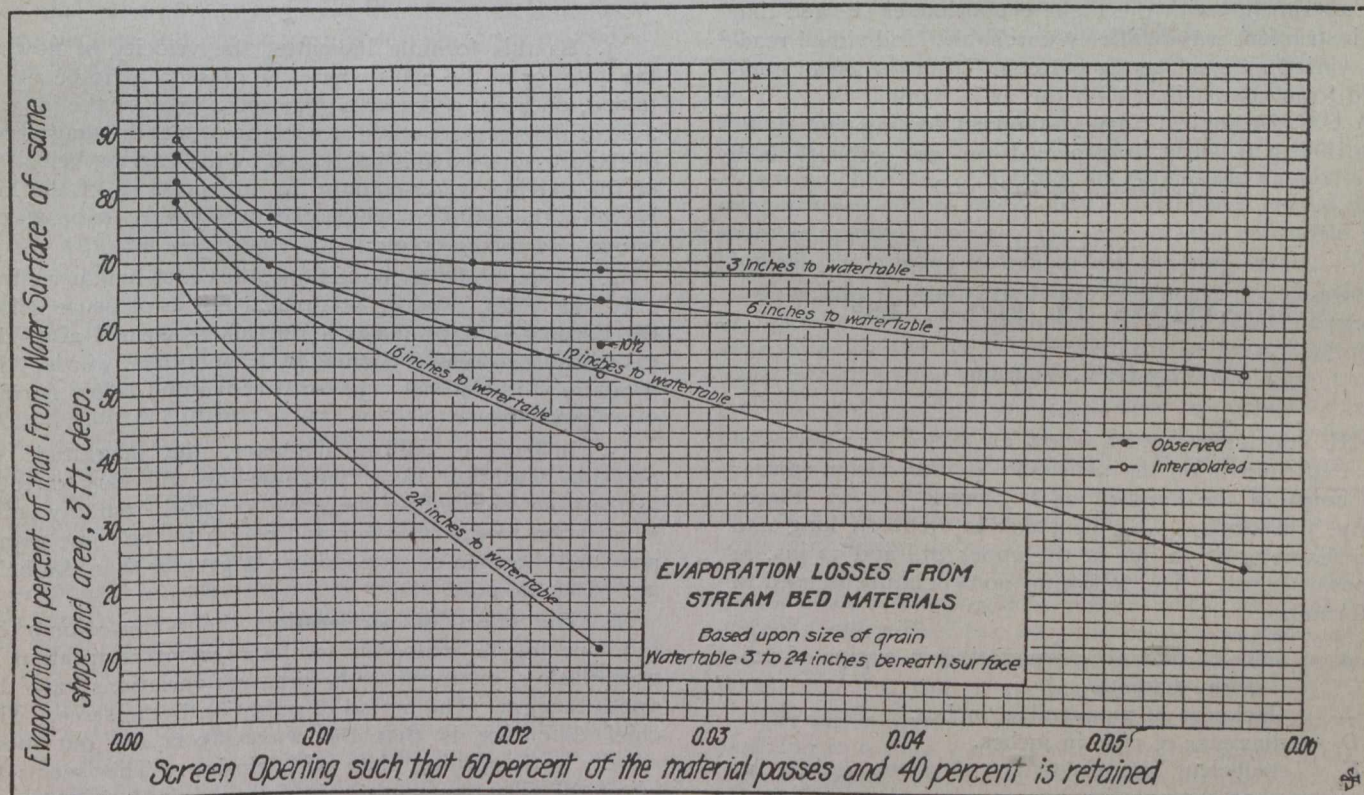


Fig. 2.—Evaporation Losses from Stream Bed Materials

The relative rates of evaporation from still and from flowing water were studied by keeping the water in one tank flowing by means of a centrifugal pump, another tank of still water being kept under conditions that were similar in other respects. After correcting the results for

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temperature was 69°, while the water-temperature at the surface was 59°, and at a depth of 2.5 ft., 46.5°. On a cold day in May the air-temperature was 45°, but the temperature of the water had increased to 56° at all depths. During the summer in the daytime the water was considerably cooler than the air, while readings in the latter part of September showed an air-temperature of 56° and