

# The Canadian Engineer

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## Water Supply of an Army Division in Palestine

Construction of Pipe Line from Ain Zerka and Wadi Reiya Springs—Chursa and Chain-Helice Methods of "Pumping" from Wells—Experiences of a Canadian Engineer with Queen Victoria's Own Sappers and Miners

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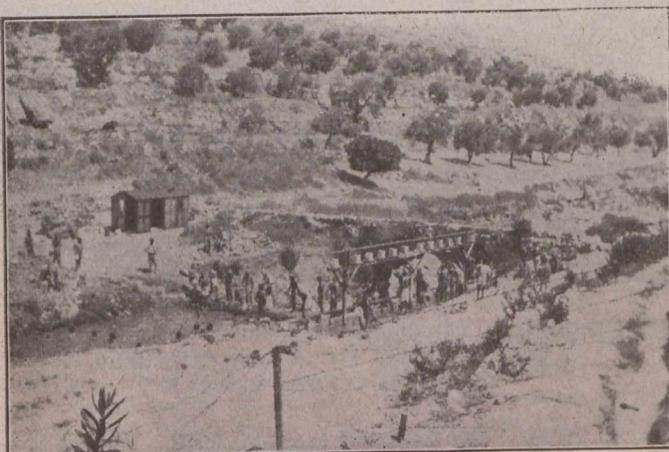
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AFTER the capture of Jerusalem by General Allenby's forces, December 9th, 1917, a condition of stationary warfare was taken up in order to allow the lines of communication to be brought forward; moreover, the winter months in Palestine are unsuitable for active operations on account of the heavy rains, which, combined with the nature of the soil, make almost impossible the movement of troops and supplies. During these months, both the troops on the plain and the troops in the hills had a sufficient water supply. The deep wells of the villages of the plains then yielded a good supply, and in the hills there were innumerable cisterns in the rock in or near the villages and usually near the top of some weather-worn rocky hill.

As this article is to deal more with the history of the water supply of a division occupying a portion of the front line in the Judean Hills, we shall dismiss the problems of water supply on the plains by saying that it consisted mostly of improving existing wells and providing storage tanks, so that pumping could be as continuous as the yield of the well would permit.

One of the duties of the engineer field companies—when the line extending from the Mediterranean, a few miles north

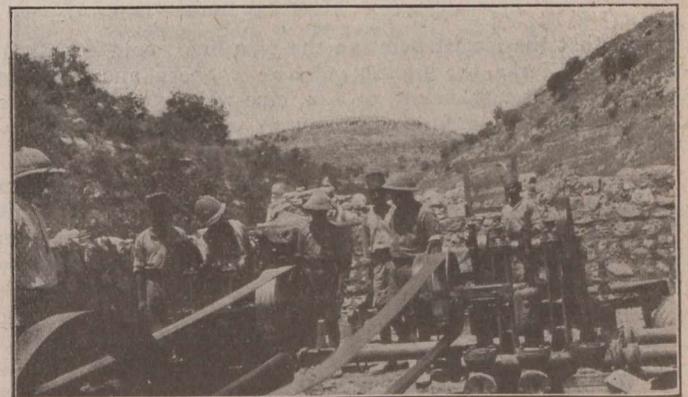
Pumps and troughs would be installed, the equipment being moved to another cistern when the one in use was emptied. Many of the villages depended on these cisterns for their supply, and of course, the presence of large numbers of soldiers did not enhance the villagers' chance of having water in the coming dry months. However, it was hoped that before the summer months the army would have advanced far beyond this region. According to maps and what information could be collected from natives, the water supply farther north was considerably better, occasional



PLUNGE POOL AND SHOWER BATHS, WADI REIYA

of Jaffa, to north and east of Jerusalem, was taken up—was to search for, to measure the contents of, to give an identification number to and to report on all the cisterns from which the troops in the area could obtain water.

The water in these various cisterns would then be tested and, according to its suitability, would be allotted for troops, for animals or for washing. This cistern water was merely drainage off the rock surface near at hand, so its purity varied with the cleanliness of the area.



PUMPS AT AIN ZERKA—WALL OF PUMP HOUSE PARTIALLY BUILT

large springs being shown on the old "one-inch-to-the-mile" maps made in 1878 by Lieut. C. R. Conder, R.E., and Lieut. H. H. Kitchener, R.E. (late Lord Kitchener). These maps were the ones in use by the force until the territory was captured, when new contoured maps were prepared by the survey companies of the Royal Engineers.

Two of these springs, Ain Zerka and a group in Wadi Reiya, were reconnoitered and measured by the writer, and each was found to yield about 30,000 gallons per hour, so it was important that we should at least secure these supplies.

In March, 1918, the division which was then on the right of the army corps on the coastal plain, commenced some forward movements which it was thought would later develop into something far more important than a mere straightening of the line. However, after a series of advances ending in two days' very severe fighting (April 9th and 10th) in which our objectives were denied to us by the enemy, orders were received to take up a defensive line.

These movements had given the division possession of several springs, the largest of which were Ain Zerka and the group of springs in Wadi Reiya. For a time all efforts were devoted to wiring in and strengthening a defensive line,