

AN ARTESIAN SYSTEM IN THE SHARON CONGLOMERATE NEAR CHARDON, OHIO

GLENN C. TAGUE

Department of Geology and Geography, Western Reserve University, Cleveland 6, Ohio

This paper is a summary of the geological information obtained in connection with the drilling of an artesian water system near Chardon, Ohio. The system is located in north central Geauga County, on the property of the Chardon Deep Springs Company, approximately two miles west of Chardon at the intersection of U. S. 6 and Chardon-Auburn Road.

The attention of the writer was first called to this artesian system in the spring of 1950 when the owner of the property requested geological information before starting a new drilling program. It was hoped that the output of water could be substantially increased. The additional water was to be used for the development of a trout stream. The original flowing well, number 1 (fig. 1); on the

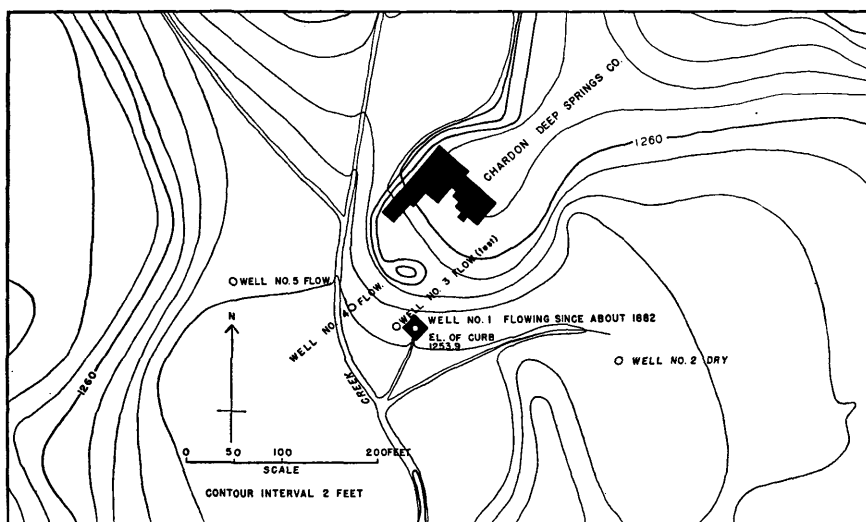


FIGURE 1. Topographic map of a part of the Chardon Deep Springs Co. property showing location of wells. Modified from a map made by T. R. Root for the Chardon Deep Springs Co.

property was drilled by the spring pole method about the year 1880 and it was the only well until the spring of 1950. The original well was drilled for oil, but drilling was stopped after a considerably flow of water hampered the operations. This well is said to have flowed at a rate variously estimated from 3000 gallons per hour to 7000 gallons per hour since it was drilled some 70 or more years ago.

A search of the geological literature brought to light two scant references to the original well. Foulk (1925) gave a chemical analysis of the water and referred to the well as "magnetic well west of Chardon." The other reference was made by Leverett (1902) who stated, "At Wallace Weaver's two miles west of Chardon, there is a flowing well which obtains its water from the sandstone, but penetrates 30 feet of drift before entering rock." Wallace Weaver owned

the property at the time Leverett studied the area. Leverett does not name "the sandstone." There is no log available for the original well and it is doubtful if one was made. Few people are living who can remember the drilling operations. Heresay depths for the original well vary from 275 to 375 feet. Water from the well has been sold for many years for its supposed health giving properties. Early bottle labels and testimonial pamphlets are said to have suggested considerable depth for the well. A sounding made in the spring of 1950 gave an indicated depth of 135 feet. However, it was considered possible that caving of the hole or an obstruction in the hole prevented the lead from going down to the full depth.

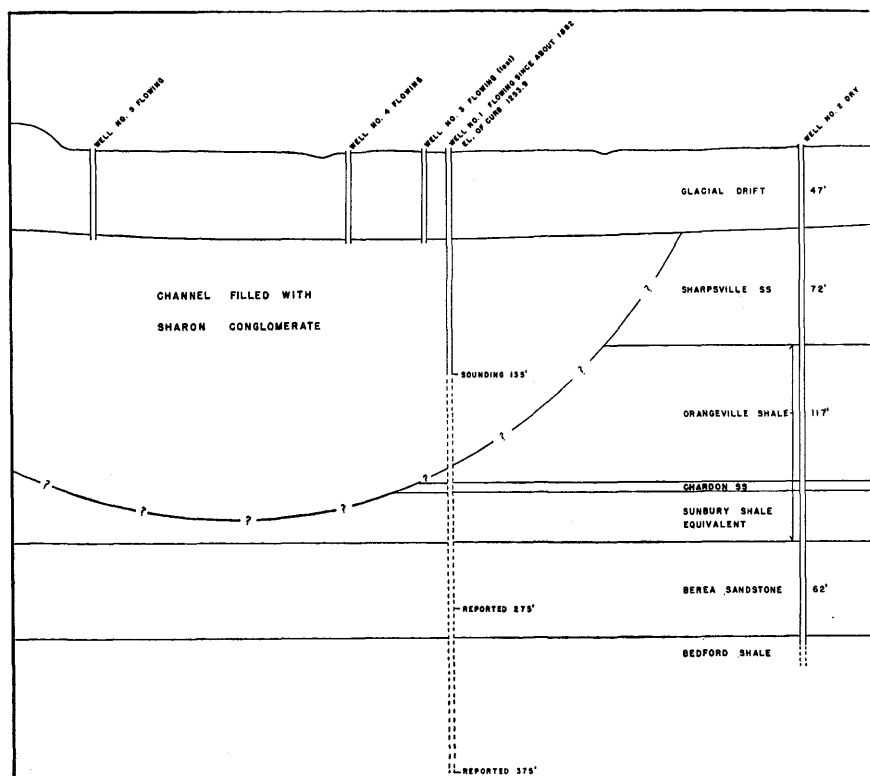


FIGURE 2. East-west cross-section between wells number 2 and 5 showing the buried channel filled with Sharon conglomerate and the capping of glacial drift.

The Sharon conglomerate caps the hills in the immediate vicinity of the property forming the east and west sides of the small valley in which the property is located. The base of the Sharon conglomerate appeared to be well above the ground surface near the original well. This observation was partially substantiated with the drilling of well number 2 which entered the Sharpsville sandstone directly below the glacial drift (fig. 2). The Sharon conglomerate was ruled out as the probable source of the water from the original well and on the basis of the available information, it seemed reasonable to expect the water to be coming from the Berea sandstone.

An extension was placed on the casing of the original well (number 1) and the static water level was found to be seven feet above the well curb or at an elevation of 1,260.9 feet. Two new well locations were surveyed. Due to the low

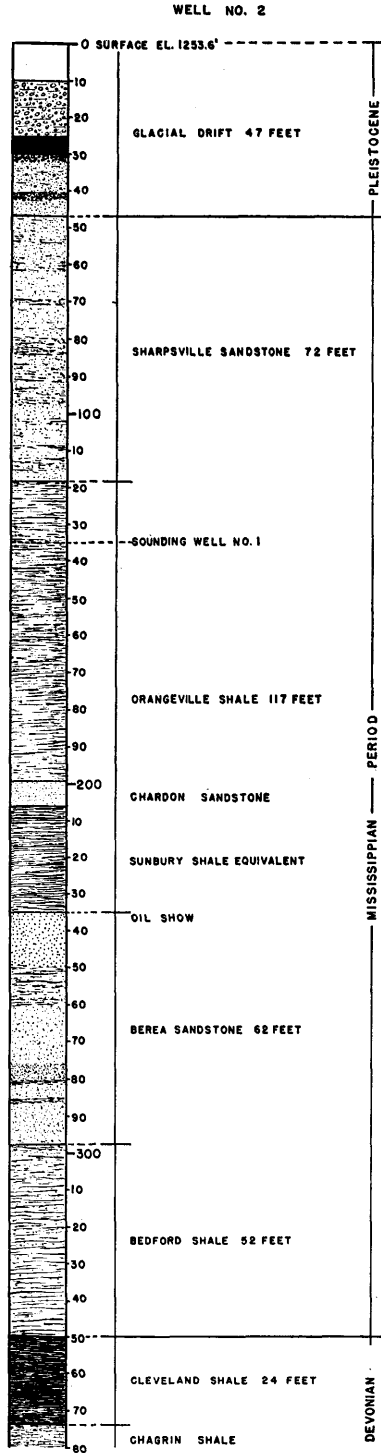


FIGURE 3. Detailed log of well number 2.

static water level and the narrowness of the valley it was impossible to make locations little more than 200 feet east or 200 feet west (transverse to the valley) of the original well (fig. 1) before reaching surface elevations too high for flowing conditions. Locations to the south and down the valley would have increased the head but were ruled out because of the intended use of the water for a trout stream. The stream was to start near the north edge of the property and flow south down the valley along the natural drainage.

Drilling began first on the east side of the original well (hereafter referred to as well number 1) at well number 2. Samples of the drill cuttings were taken at five foot intervals on this well. The samples were carefully washed and a detailed log (fig. 3) was made. The drill passed through 47 feet of glacial drift consisting of till, gravel, sand, and clay. A small flow of water was obtained from a layer of gravel near the bottom of the drift. The drill then passed through 72 feet of Sharpsville sandstone, followed by 117 feet of Orangeville shale before reaching the top of the Berea sandstone at a depth of 235 feet. A show of oil was found in the top of the Berea sandstone, but no water. Drilling continued through the Berea sandstone in the hope that the source of the water might be near its base. Before drilling operations were suspended the hole was made through 62 feet of Berea sandstone, 52 feet of Bedford shale, 24 feet of Cleveland shale and had penetrated 5 feet into the Chaprin shale. Well number 2 was a dry hole.

Before further efforts at more distant locations, a test hole was then drilled about 25 feet west of well number 1 to determine its source of water. The test hole, well number 3, passed through 50 feet of glacial drift and entered a yellowish quartz sandstone with quartz pebbles. When the sandstone was penetrated a strong flow of water issued from the casing and well number 1 stopped flowing. The top of the casing on well number 3 was approximately two feet below the top of the casing on well number 1. The pebbly sandstone was identified as Sharon conglomerate. The 275 feet to 375 feet as indicated depths for the source of the water in well number 1 had turned out to be a mere 50 feet.

Wells 4 and 5 were drilled west of well number 1. These wells penetrated the Sharon conglomerate at a depth of 50 feet and both were flowing. The flowing wells appear to have been drilled into a channel filled with Sharon conglomerate and capped by glacial drift. The eastern edge of the channel (fig. 2) lies somewhere between well number 1 and the dry hole, well number 2. The western edge of the channel is indeterminable, but is situated somewhere west of well number 5. All four flowing wells, numbers 1 (original), 3, 4, and 5, are within a horizontal distance of 420 feet. Each well effects the others and it is doubtful if the owner has appreciably increased his over-all supply of water. Two years later the flow and static water level appear to have been little effected by the three additional holes.

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