

# *Chesterfield & District Local History Society*

HISTORY PAPER NO. 6.

## CHESTERFIELD WATERWORKS

CONTRIBUTED BY MR. S. L. GARLIC, EXTRACTED BY MRS. N. K. WEBB, WHO LEFT THE AREA MORE THAN 20 YEARS AGO, LEAVING HER WORK WITH MR. GARLIC.

The late Chesterfield Gas and Water Board promoted a Bill in Parliament during the session 1910-11, seeking to obtain powers to raise a sum of £145,500 for the purpose of carrying out the following;

- (a) The Holme Brook Pumping Station, and pipe line from that station to the Middle Linacre Reservoir, in order to utilise the water from the 360 acres of catchment area below the Linacre Gathering Ground.
- (b) A pipe line connecting the Chesterfield Rural District's Northern Gathering Ground with the Board's Linacre Gathering Ground,
- (c) The construction of an impounding reservoir on the Bar Brook; Catchwaters on the catchment areas of the Blake, Blackleash, and Bar Brook; a tunnel through the dividing ridge of the Derwent and Rother Valleys for the conveyance of the water to the Linacre Gathering Ground.

The above scheme was known as the Barbrook Scheme. The Act received the Royal Assent in July 1911, and during that year works (a) and (b) were constructed.

The Board commenced to carry out the Barbrook Scheme in the early part of 1915 but the works were closed down under an order from the Ministry of Munitions. The Board was allowed to complete the permanent lining of those portions of the tunnel already driven.

The position in 1916 was that the consumption of water was approximately equal to the yield of the three driest consecutive years. Consideration was then given to the possibility of obtaining underground water. In August 1918 it was reported to the Board that, although a case has not been made out to the Ministry for the carrying out of the Barbrook scheme during the prosecution of the war, they would, nevertheless, be in serious danger of a water shortage, in the event of a dry period before the completion of the scheme, and that after a careful study of the geology of the district it was advisable to prove, by means of boring, the quantity and quality of the underground water in the area of supply.

Permission was granted for an experimental borehole to be put down at Whispering Well. Sufficient boring tackle was secured to enable a trial borehole to be sunk through the Alton Sandstone, the Rough Rock, and the Longshaw Grit. The borehole resulted in an increase of the daily quantity of the artesian flow from 70,000 gallons to 250,000 gallons.

Constructional work on the Barbrook Scheme was recommended in the early part of 1919, but it became apparent that the final cost would be abnormally high. It was thus decided to postpone the carrying out of the Barbrook Scheme with certain exceptions, until the extent

of the underground water in the area of supply had been proved.

## GEOLOGY

The area lies on the east side of the Pennines anticline which brings to the surface wide tracts of carboniferous limestone, but east of the axis towards Chesterfield, successively younger strata are passed over with a prevailing easterly dip, the formation is represented in ascending order being the limestone shales, millstone grits, lower coal measures, and the productive coal measures. The last mentioned gave their base about two miles west of Chesterfield. The geological structures affecting the question of underground water in the district are the subsidiary folds, known as the Ashover anti-cline and the Chesterfield syncline.

The Chesterfield syncline is a pronounced feature in the geological structure of this portion of Derbyshire. The axis of the syncline has considerable pitch. At Big Moor, on the most northerly gathering ground, the trough is in Rough Rock at an elevation of 1,100 feet, but the pitch is such that the Rough Rock under Chesterfield syncline is at a depth of 1,800 feet. In the area lying to the south and west of the Chesterfield syncline, the ground rises gradually from an elevation of 400 feet at Chesterfield to 1,100 feet at a distance of six miles west of Chesterfield to the outcrops of the Rough Rocks and Chatsworth Grit. From the Rough Rock the ground falls sharply into the valley of the Derwent and its Tributaries, exposing the various beds of Millstone Grit in narrow bands.

The water-bearing zone, exclusive of the Limestone, consists of the Chatsworth Grit, Longshaw Grit, Rough Rock, Alton and Associated Sandstones and the Wingfield Flagstone group. The various sandstones in the district, where exposed at the surface, are usually jointed and, in general have the appearance of being able to absorb and convey water.

## TRIAL BOREHOLES AND PERMANENT WELL

(a) A trial borehole at Hunger Hill with the object of tapping the Chatsworth Grit. Water collected from small tableland forming the ridge dividing the Derwent and Rother valleys (Early 1921)

(b) A trial borehole at Nuttack Lane with the object of proving the existence, or otherwise, of water in the Wingfield Flagstone group, and the sandstone below that group. (October 1919)

(c) A trial borehole at Holme Brook Pumping Station to test the existence of water in the upper strata of the Lower Coal Measures. (Early 1921)

The well sinking could be suspended at any time and the sinking pumps utilised for the purposes of supply. During the dry year of 1921 an average daily quantity of 370,000 gallons was pumped into the nine inch supply main to Chesterfield from the partially completed well, thus averting a serious water shortage.

Sanction was given by the Ministry for a loan of £10,000 for the completion of the experimental boreholes.

## YIELDS

Whispering Well – 464,000 gallons at a depth of 58' — 74<sup>1</sup> below ground level. Pumping in operations ceased on the morning of December 30<sup>th</sup> 1921 and after a period of thirty six hours had elapsed, the water overflowed the shaft.

Hunger Hill – Artesian flow remained constant at 80,000 gallons daily, until installation of permanent plant, when owing to the removal of sand from the fissures in the rock, the artesian flow increased to a daily quantity of 140,000 gallons. The yield at a suction depth of 24 feet, reached after 17 days continuous pumping, was a daily quantity of 150,000 gallons,-the water rising to the surface again, upon cessation of pumping, after 124 hours. A continuous air lift, over fourteen days gave a daily yield of 280,000 gallons at a depth of 6 feet, the water in this case rising to an estimated 400,000 gallons.

Holme Brook – A continuous air lift over a period of fourteen days, resulted in an average daily yield of 219,000 gallons, but the underground water surfaced again until a period of fifteen days had elapsed. Estimated daily yield - 100,000 gallons.

Nuttack Lane – A continuous air lift over a period of fourteen days resulted in a daily yield of 90,000 gallons.

## QUALITIES OF WATER

Whispering Well –A satisfactory water both chemically and bacteriologically, with a moderate degree of hardness.

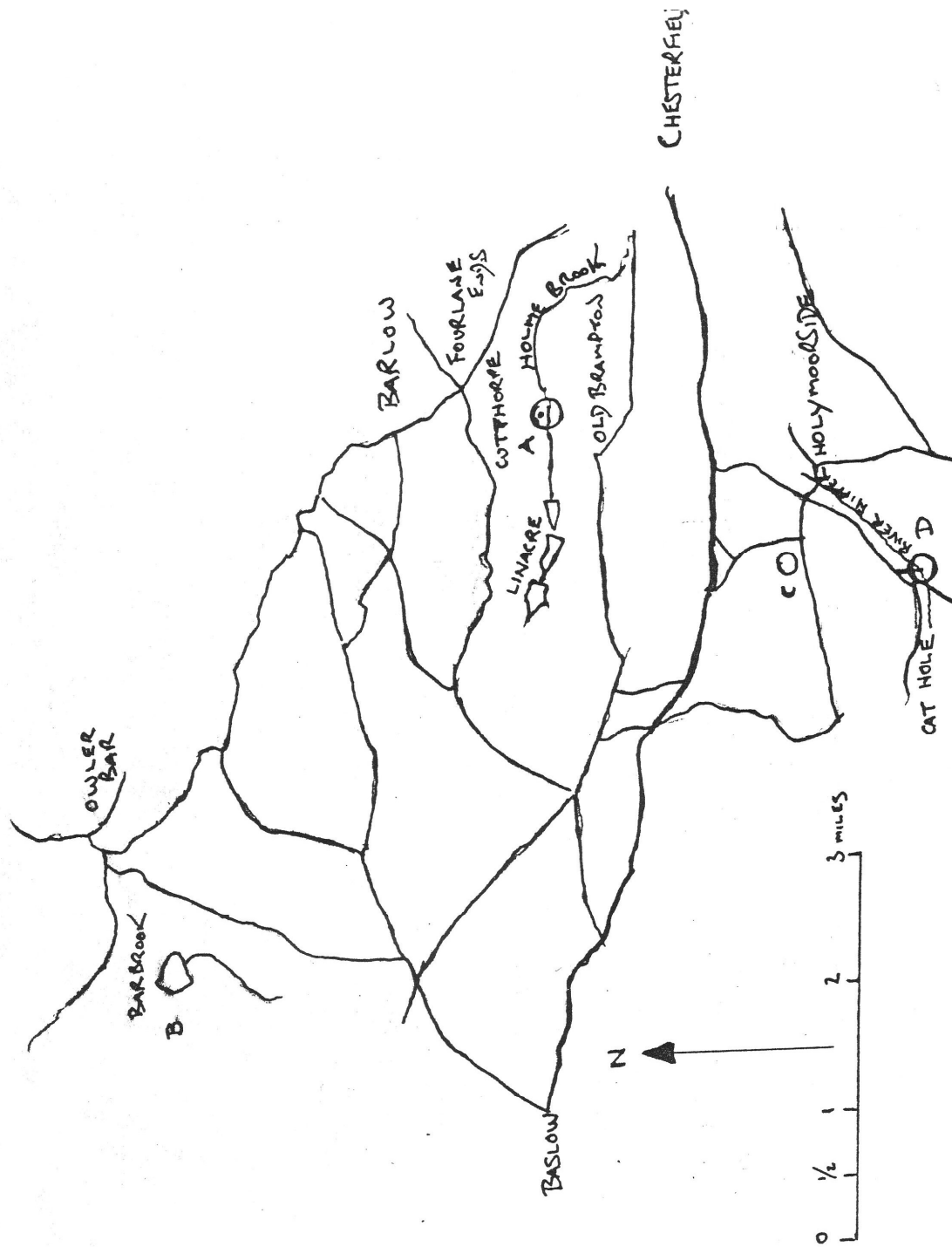
Hunger Hill – A satisfactory water with an extremely low number of organisms per c.c. but a hard water.

Holme Brook – A satisfactory water of a remarkably soft character, the hardness being only one part per 100,000.

Nuttack Lane –An unsatisfactory water bacteriologically.

## POSTSCRIPT

Domestic and industrial water came under the control of Chesterfield Corporation in November 1920., A new reservoir was then constructed at Barbrook with the boreholes at Whispering Well, Holme Brook and Hunger Hill. A service reservoir was constructed at Whispering Well.



- A. Holme Brook Pumping Station, now demolished and Linacre Reservoirs
- B. Barbrook Reservoir
- C. Borehole at Whispering Well not now used
- D. Borehole at Hunger Hill closed since circa 1980s. Pump House still stands.

The names of the rivers have been marked. All other lines indicate roads.

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