Lakes, and the Impact Of Man on River Valleys and Water Supplies in the North Cotswolds

This article continues the 'river and drainage' theme from the two previous papers, but focusses on the features in the landscape which arise from man's changes to the natural water courses and water supply in the North Cotswolds. These changes have been made over a period of a thousand years or more and were made for a wide range of different purposes, including community supply, farming and food production, industrial activity, and estate enhancement. Localities mentioned in the text are shown on Fig. 1.

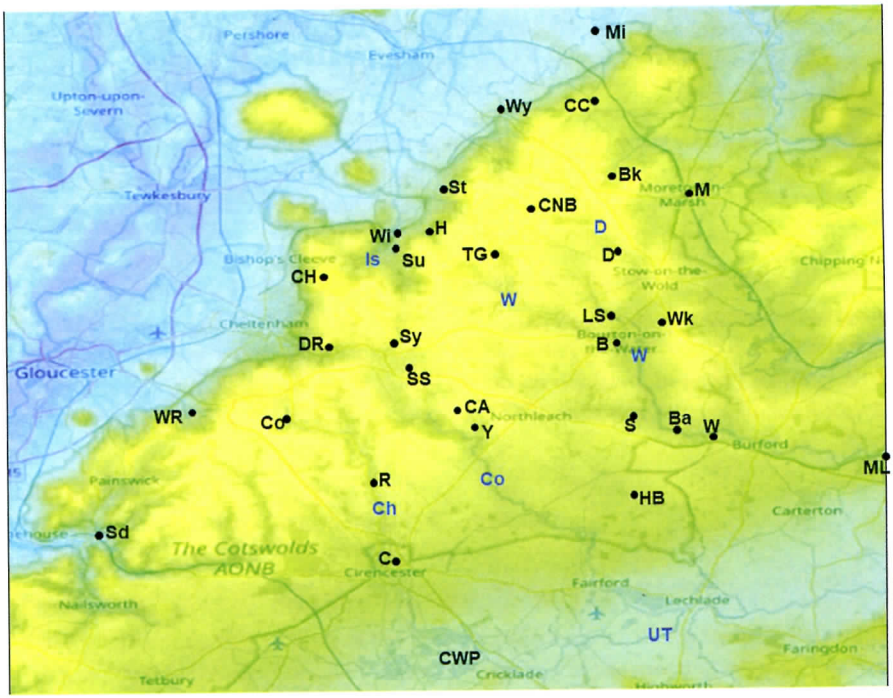

Fig. 1: Map showing the location of places mentioned in the text (in black):-
B = Bourton on the Water; Ba = Barrington; Bk = Blockley; C = Cirencester; Co = Cowley; CA = Compton Abdale; CC = Chipping Campden; CH = Cleeve Hill; CNB = Cutsdean Notice Board; CWP = Cotswold Water Park; D = Donnington; DR = Dowdeswell Reservoir; H = Hailes Abbey; HB = Hick's Barn; LS = Lower Slaughter; M = Moreton in Marsh; Mi = Mickleton; ML = Minster Lovell; R = Rendcomb; S = Sherborne; Sd = Stroud; St = Stanway; Su = Sudeley Castle; Sy = Syreford; SS = Shipton Solers; TG = Temple Guiting; W = Windrush; Wk = Wyck Rissington; Wy = Willersey; WR = Witcombe Reservoir; Y=Yanworth.

Rivers mentioned in text (in blue)
Ch = Churn; Co = Coln; D = Dikler; IS = Isbourne; UT = Upper Thames; W = Windrush

Community supplies

- Village ponds:
  Attractive examples of village ponds are found in Willersey and in Wyck Rissington. In both cases, the pond occupies the village green (both probably of considerable antiquity), and around them are groupings of attractive 17-18th Century houses (Verey and Brooks, 2002). Springs were the dominant source of water to many villages: one spring with an unusual spout is the crocodile found at Compton Abdale (Fig. 2).

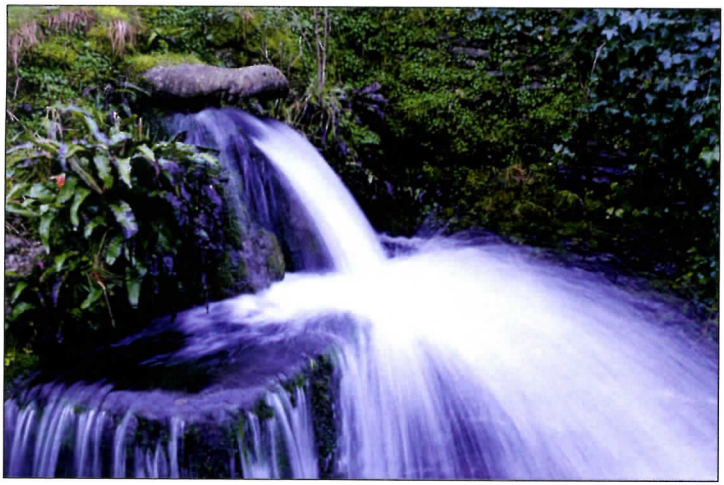

Fig.2: Crocodile-spouted spring in Compton Abdale

- Reservoirs:
  A couple of reservoirs were created in the N. Cotswolds in the Victorian era by local corporations for the supply of drinking water to their growing cities, namely Dowdeswell (Cheltenham) and Witcombe (Gloucester).

Farming and food production

- Medieval fish ponds:
  Fish ponds were often attached to Medieval religious houses e.g. Hailes Abbey, Cirencester Abbey, and Minster Lovell. These are all now ruined and there is no visible sign of their fish ponds on the ground, but their earlier presence can be seen from old 6" OS maps (National Library of Scotland website). A more recent example of a lake attached to a country house (Rendcomb) is described by the OS as a fish pond (Fig. 3), but it is much more likely to have been an aesthetic lake.

- Dew ponds and Tures:
  In the mid-late 18th century, when the great open fields of the high wolds were enclosed, it remained essential to provide the flocks of sheep in the newly-walled fields with access to water. So dew ponds were dug, lined with clay (to prevent the water from soaking away) and then sealed with stones (to prevent the hoofs of sheep or cattle from puncturing the clay base (Fig. 4)).
  The ponds were designed to catch the rain and dew and were divided by radiating stone

walls to give each field a share of the water. More distant fields were sometimes given access to dew ponds by tures – narrow drystone-walled peninsular extensions to the fields enabling the sheep to reach a dew pond or other source of water.
Cutsdean Parish is unusual for the number of tures identified and there is a very informative descriptive notice board and map located on the roadside at GR 108314 adjacent to Ling Ground.
One surviving dew pond which lies on a public footpath is located at Hick's Barn (GR 186077, and Fig. 5) some 3 km NW of Eastleach.

- Sheep washes:
  Prior to shearing, the Cotswolds sheep were washed, either in streams or pools, as was done in Sherborne throughout the Medieval period, or else in specially constructed, banjo-shaped, stone sheep washes. One of these is located on the east flank of Cleeve Hill, just downstream from the source of the River Isbourne (Fig. 6). Another can be found (well overgrown) on the footpath ~250m ENE of Yanworth church.

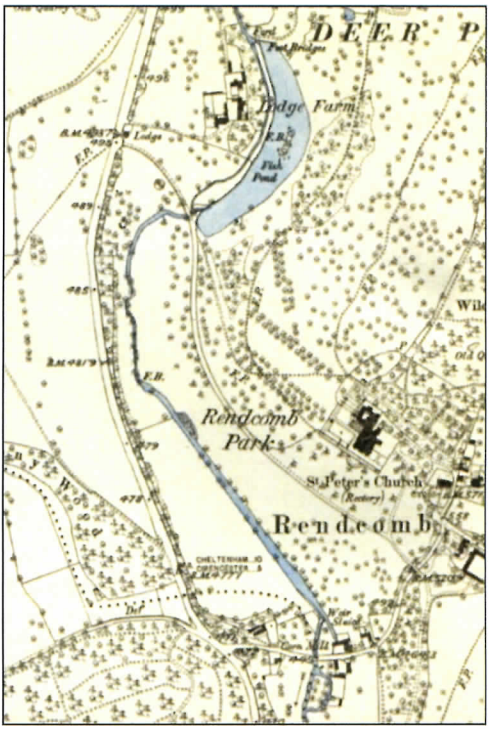

Fig. 3: OS 6" map (1885) showing Rendcomb Lake described as a 'fish pond'. Note also the straightened course of the River Churn from the lake to the corn mill.


Fig. 4: Reconstructed Dew Pond, showing the stone lining to protect the clay seal below from puncture by sheep/ cattle hoofs. Photo from farmoffice@firfarm.co.uk

Fig. 5: The dew pond (now dry – it was a very hot summer!) at Hick's Barn, between Aldsworth and Eastleach (GR 186077).

Fig. 6: Photo from signboard showing a sheep wash in use, Cleeve Common. Constructed in 1896, and restored in 2018-20, it is one of the few remaining in the North Cotswolds.

Industrial activities

- Gravel pits:
  Since the 1920s extraction of Cotswold-derived limestone gravel from the river terraces of the Churn and Upper Thames around South Cerney, and from the Windrush below Bourton on the Water and south of Witney, has given rise to extensive lakes, formed because the gravel pits were excavated below the water table. These lakes now form the Cotswold Water Park, the largest man-made water park in UK: in addition to its importance for wildlife and recreation, the lakes form an important flood water storage scheme.
- Mill ponds:
  In the Domesday Book, Gloucestershire was recorded with 251 mills – dominantly corn mills and almost all water-powered. Woollen mills rose to prominence from the 12th

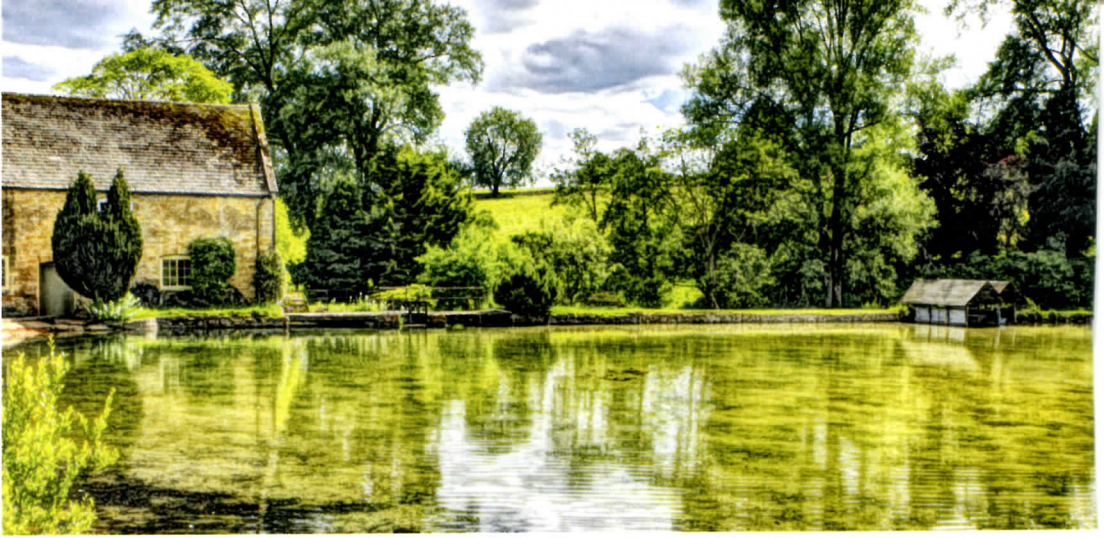

Fig. 7: The mill pond at Donnington Brewery, formed by the damming of the River Dikler, to provide water to power the old corn mill. The top of the water wheel is just visible immediately adjacent to the brewery.

century as the Cotswold wool industry developed, on the back of (literally) the huge flocks of sheep which grazed the open fields of the high wolds. Initially, these mills would have been fulling mills, using the soft clay from the seam of Fullers Earth lying between the Inferior and Great Oolite limestones for washing and cleaning the wool. Temple Guiting is reported to have had the earliest recorded fulling mill in England (1185: Bingham (2009)). From the 16th century onwards, wool weaving mills became pre-eminent, especially in the Stroud area, as woollen cloth overtook fleeces as the principal export, and the scarlet cloth of Stroud became famous as the source of British army uniforms.

Wool, however, was not the only fabric being woven in the Cotswolds at this time. Flax grown around Moreton in Marsh supplied local linen mills; whilst mulberry trees around Chipping Campden and Blockley formed the basis of a silk spinning and weaving industry – in turn supplying the ribbon factories of Coventry.

The woollen mills also created a network of supplier industries, e.g. the growing of teasels (for raising the nap of the wool cloth) and woad (for making a colour-fast blue dye). Meanwhile, corn mills and, to a lesser extent, wood (saw) mills continued in use widely throughout the Cotswolds from Medieval to Victorian eras.

Good references for the history of mills and milling in the Cotswolds are Bingham (2009), Hadfield and Hadfield (1973), and Finberg (1955).

In the upstream reaches of the Cotswold dip-slope rivers, mill ponds were essential to provide an adequate supply of water to the mill. By contrast, the lower reaches of the dip-slope streams (e.g. the Windrush at Windrush, and Barrington), and the scarp-slope streams (e.g. the Isborne at Winchcombe,) have a sufficiently large and dependable flow that mill ponds are not required.

Two examples of dip-slope mill ponds can be seen at:-

- Donnington: a large mill pond (Fig. 7) was created by damming the River Dikler to power two waterwheels (one of which survives).

The mill was originally a corn mill, then a cloth mill, then returned to corn milling. In 1827,

it became a brewery when bought by Thomas Arkell, and until 1959, all power to the brewery was provided by the water wheels.

- Syreford: a large mill pond was created by damming the River Coln to provide water to the adjacent mill.
- No mill pond was created at Lower Slaughter, where the well-known early 19th century corn mill still has a working water wheel. Instead, the mill leat (the channel that carries water from the river to the mill) was dug wide and extended upstream to provide a dependable water supply.

Fig. 8: Google Earth comparison of Sherborne Upper Water from 2003 and 2021, showing how the delivery of sediment and nutrients by Sherborne Brook, and the growth of marginal and shallow-water vegetation is shallowing, infilling, and reducing the area of the lake. (GR 167150).

Estate enhancement and protection

- Aesthetic lakes:
  These lakes characterise the landscaping around many of the Cotswold's country houses and estates, including the classic example of Blenheim Palace, where Capability Brown dammed the River Glyme to create the large lake which lies in front of the house. Further, smaller scale examples of these landscaped lakes in the North Cotswolds are found at:-
  o Sherborne – an upper and lower lake of 18th century construction, separated by a cascade. An ice house is found on the footpath around the estate south of the lower lake. These structures, of brick or stone were insulated by being largely buried in the ground, and were built to keep ice harvested from the lake in winter, frozen into the summer months, for use in the kitchens of the big houses.
  The temporary nature of lakes in the landscape, resulting from sediment brought into the lake by rivers, and from vegetation encroaching from the shallows, is well


Fig. 9: Stanway Fountain. From www.stanwayfountain.co.uk

illustrated by the Upper Sherborne lake during the present century (Fig. 8). All lakes and ponds must be dredged and cleared at intervals to keep them clear.
o Cowley Manor – with its attractive 19th century lakes and cascades.
o Stanway House – a beautiful Jacobean manor house with a magnificent water garden. It is famous for its 300 foot high single-jet fountain (Fig. 9) which is the highest in Britain, and the highest gravity-fed fountain in the world. The fountain is 'powered' by the head of water from the top of the escarpment ~175m above the house.

- Moats
Moats were defensive bodies of water surrounding castles and fortified manor houses and generally date from the early 12th to late 16th centuries. Given the earliness of this period, and the extent of reconstruction which surviving country estates suffered during Elizabethan – Georgian – Victorian periods, I have been unable to find examples of any extant defensive moats in the North Cotswolds. The closest example I could find is:-
o Broughton Castle – which dates from 1306, and was crennelated and fortified in 1406, though most of what can be seen today dates from the 1550s. It remains as a moated and fortified manor house (Fig. 10) located near Banbury close to the border of the Cotswold AONB.
There are several examples, however, of remnant moats in the North Cotswolds, namely:-
o Shipton Solers Manor – "two sides of the moat remain to the south-east of the house" (Verey and Brooks (2002) and Fig. 11). The house dates from the early-mid 17th century but is possibly on the site of an earlier (~13th century) house, to which the moat may have belonged.

Fig. 10: Oblique Google Earth image of Broughton Castle, showing the large moat surrounding it.

o Sudeley Castle, in Winchcombe – originally dating from the end of the 14th century. Verey and Brooks (2002) mention a long pond in the garden in the northern part of the estate, which was formerly part of a moat.
o Mickleton – where a circular moat was discovered from aerial photographs at GR 1603 4277, some 800m south of the village (Carpenter, 2008). It survives today only as shallow earthworks and crop markings.

Human–river interaction

A final reference to man's impact on the rivers and landscapes of our area should be made. From Neolithic times onward (i.e. since ~6000 years ago) the development of agriculture and

the population growth resulting from it led to the onset of human-river interactions, with an increasingly negative impact on the natural fluvial and ecologic environments in more recent times. Increasing intensity of farming, human settlement, and industry in our river valleys has led to increasing levels of pollutants (carbon-, nitrogen-, and phosphorous-based compounds), whilst drainage of valley bottoms and water meadows has led to the channelisation of many of our rivers (e.g. see Fig. 3). This removal of meanders reduced the areas of river bed and river bank environments, with adverse impact on floodplain biodiversity (Hoffmann et al (2010)).

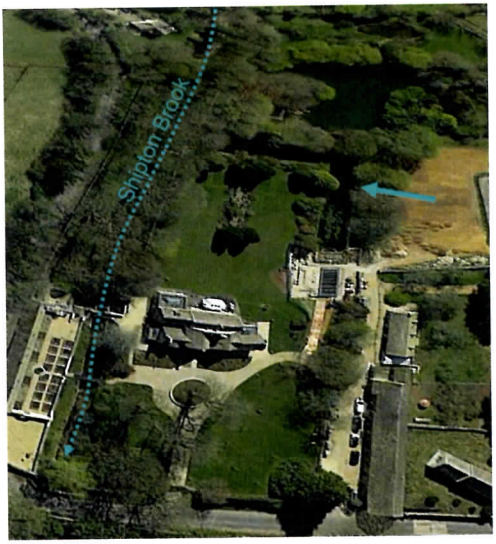

Fig. 11: Oblique Google Earth view over Shipton Solers Manor showing the two-sided moat, possibly charged from the adjacent Shipton Brook.

More recently, global warming has led to the increased frequency of heavy storms, and the reduced areas of water meadow is leading to an increased severity of flood events, with consequent impact on settlement and infrastructure.

Research is now focussing on how to reduce or reverse many of these adverse impacts, by 'unstraightening' channelised river courses and 're-wilding' of river banks, river beds, and floodplains to increase the area of these environments and thereby:-

- Decrease the impact and severity of flood events (see Jeans (2022), Fig.6 therein), and
- Increase the buffering ability of plants and terrestrial and aquatic micro-organisms to reduce levels of C, N, and P in the rivers and in the sediment they carry (Burt et al (2021)) and enhance the importance of these environments as carbon sinks.

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References:

Bingham, J. (2009). The Cotswolds. Signal Books. Oxford.
Burt, T. and 3 others (2021). Slopes: solute processes and landforms. In Burt. T. and 2 others, Geol. Soc. London Memoir 58.
Carpenter, E. (2008). A circular moat at Long Hills Farm, Mickleton, Gloucestershire. Trans. Bristol & Gloucs. Archaeo. Soc. 126, 131-138.
Finberg, H.P.R. (1955). Gloucestershire. Hodder and Staughton. London.
Hadfield, C. and A.M. Hadfield (Eds. 1973). The Cotswolds: a new study. David and Charles. Newton Abbot.
Hoffmann, T, and 8 others (2010). Human impact on fluvial regimes and sediment flux during the Holocene.... Global and Planetary Change 72, 87-98.
Jeans, P.J.F. (2021). Slides, Cambers, Slumps, and 'Terraces': Part II – Cambering. GNS News, September 2021.
Jeans, P.J.F. (2022). Typical landforms of River Valleys. GNS News, June 2022.
Verey, D. and A. Brooks (2002). The Buildings of England: Gloucestershire 1 - The Cotswolds. Yale Univ. Press, London.