

UNDERSTANDING SILTATION IN THE DEVONSHIRE AVON

Contributions from local knowledge

Introduction

The so-called 'Ancient Wisdoms and Anecdotes' listed below were collected by the late John Crawford during recent years from Aune Conservation Association (ACA) members and others familiar with the Avon. Further observations have been added more recently. Some of these people and their forebears have lived in the South Hams for many years, others have visited on regular holidays - some since childhood days; yet others, have arrived more recently in this idyllic part of South Devon. However, these groups are united in being keen observers of their environment and the changes occurring in it over time.

This array of observations should not be lightly dismissed; no matter how subjective or judgemental some of the interpretations; they form an important part of local folklore. Although the accuracy of some of the distant memories cannot be verified and clear causal links cannot be established between past events and the current state of siltation of the estuary, the body of circumstantial evidence for accelerating change within the living memory of many people is very strong. It is a fact that all estuaries fill up over geological time but the siltation of the Avon estuary would seem to be a much more rapidly developing situation. It was the purpose of the ACAs Siltation Research Project to debunk rumours, establish some scientific facts and try to identify ways to slow down or prevent the loss of our precious waterway. These local observations are offered as a backdrop to the scientific studies.

The collection of 'Ancient Wisdoms and Anecdotes' has been made deliberately anonymous but we are very grateful for the priceless contributions that so many people have made to the Siltation Research Project by this means.

Avon Flow

1. The Avon Dam: commissioned 1956. If there has been an acceleration in siltation since that date, this might be attributable to changes in the amount of water abstraction or to the operation of the fisheries "compensation" regime. The Water Board reached an agreement with the Riparian Owners to maintain a flow at all times to protect the fishery interests. However, the operation of the dam is likely to have reduced the scouring effect of the flood waters in spring and autumn which would tend to sweep sand and silt sediment out with the outgoing tide, keeping the navigation channel clear.
2. End of harrowing of the lower estuary (Bantham). Until 1960s, George Eliot used to operate an in-board motor boat which he apparently used for cockle dredging. Since the 60's the cockles appear largely to have disappeared from the Ham and there has been no dredging. It is thought that in dredging the cockles, the silt deposits in the main navigation channel may have been loosened and washed out to sea. The boat in question appears on the Hurrell archive of the Parish.
3. Decommissioning of the Paddle Steamers. Until the summer of 1939, paddle steamers used to bring day trippers from Plymouth to Bantham harbour. In May 1940 a signal from the Admiralty sent all available small ships to Dunkirk, a mission from which few boats returned and the service was not restarted in 1945. The assumption is that the paddle wheels kept the sediment in suspension and subject to the action of river and tidal flow.
4. Water-skiing. Although started on the Avon in the 1960s, it was not until the 1980s that more powerful outboards became established. The assumption is that propellor hits from the boats are breaking up the sediments at Mud Walls and shifting it further down stream. Is it ending up on the Aunemouth flats above Bantham Harbour? It is also possible that the navigational channel is being flattened in the turning areas at the top and bottom of the run. However, it can be argued that water-skiing could have a beneficial effect in keeping the navigation channel clear; it is claimed by some that the figure of eight pattern routinely followed by the skiers is visible in the sand at low tide.
5. Cessation of barges. Until 1939, heavy barges used to ply between Aveton Gifford, Duke's Mill and the Lime Kilns to the open sea off Burgh Island and back. These barges were entirely dependent on the tidal flow for their motive power

and in order to facilitate steering, chains were used. The presumption is that these chains were instrumental in keeping the navigation channel clear

6. The water meadow below the bridge at Aveton Gifford is defined by an embankment created at the end of the 18th C. and breached (temporarily) during the war. Did this earthwork initiate the meanders on the upper estuary and commence the deceleration of the stream?
7. One person recalls that whilst playing as a child on the meadows below Knapp Mill he was surprised by a four foot wall of water in a summer flash flood. This would have been before the dam was built. In those days the flood plain was covered with rushes and yellow iris but subsequently this land was converted into pasture.

Sedimentation

8. After heavy rainfall, the main river and feeder streams below Aveton Gifford frequently run an opaque brown with the suspended sediment draining from surrounding farmland. Soil slippages on to roads from steep slopes are not uncommon.
9. Spoil from the Aveton Gifford By-pass. When the by-pass was completed in 1989 a huge quantity of silt spoil was dumped in Timbers car-park adjacent to the bridge over the Avon and a dispute ensued as to who was responsible for its removal. In the great storm of 1989-90, this spoil was washed into the Mill Leat and thence into the upper estuary.
10. Removal of hedges at Hendham and Wood Barton. Some time in 1990s the landowners used grants to remove hedges, leaving a lunar landscape which, under plough, may have increased soil run-off. It is perhaps significant that after a storm the waters above Topsham Bridge remain clear, but below the bridge turn chocolate colour
11. End of “drawing voyer”, described by Hubert Snowdon in his booklet “Keeping Faith with the Soil”. Traditionally, tenant farmers were required to remove any build-up of topsoil from the bottom of their fields and cart it to the top during winter hedging and ditching. Responsible gentlemen farmers also followed this practice. After 1939 it is unlikely that the manpower was available on the farms to continue drawing voyer. However, in recent times, farm labourers have been seen recovering soil washed down onto the Tidal Road below Milburn Orchard.
12. An ACA member recollects that some 40 years ago if he wanted to wade across the estuary above Bantham Harbour, he would be in water up to his arm-pits; now the depth scarcely reaches his knees.
13. Remnants of the quay once used by grain barges to reach the mill are still visible about two-thirds of the way up Were Marsh or Duke’s Mill Creek. Access to the main river is now completely blocked by a combination of silt, sandbanks, mudflats, consolidated mudbanks and associated vegetation (e.g. Cordgrass, Hemlock Water Dropwort and Himalayan Balsam). A similar process is underway at Aunemouth.
13. Some 50 or more years ago, it was still possible to walk across the mouth of Were Marsh on firm ground; when the Atkins team were surveying in 2005, as part of the Siltation Research Project, they found themselves up to their waists in silt.
14. Deforestation of the Avon Valley. From 1915-18 the spread of trench warfare required huge quantities of timbers and landowners were encouraged to cut down plantations on the slopes of the Avon. This may have opened up steep slopes to cattle and, in recent years, to arable farming. Prior to that most run-off from fields would have been soaked up by woodlands.
15. Users of the Tidal Road have observed that it appears to flood for a substantially longer period at high tide. This could indicate that the silting up of the Estuary causes the tide to spill out more widely and that the tide is slower on the ebb.
16. 'Our N Efford creek has silted up probably the most/fastest in the whole of the river since we have been here, and accelerated unimaginably in the last five or six years. I think it began when the very steep hill half way up this little valley was rented out to a farmer for potato crops, and the soil run off in those 3 or 4 winters of flash flooding clogged up the entire valley. On one occasion the tide was in so I had to walk to the village to collect the children from school, and the trapped water was so deep in our back lane on the way back the children had to wade through 2 ft of water – they’ve never forgotten the fun, and I’ve never forgotten the VAST quantities of soil washed off that hillside that particular winter! I am sure that is what accelerated the siltation/spartina growth here.'

Sand Ingress

17. The Bantham “Fish Trap”. At very low tide, an apparently man-made string of rocks can be seen dividing the stream in front of Cockleridge. This, once, may have been a more prominent fish trap. Its existence would certainly have influenced the hydrology of the Estuary, but its origins and original shape are uncertain. Alternatively it has been suggested that the line of boulders was placed there in order to define and protect the navigation channel for the barges (see 5 above). An ACA member reports that it is usually referred to as “the weir” but may once have been a natural feature. (A recent report on fish traps from the Devon Archaeological Society reports only wooden structures).
18. There is a widely held belief that sand gets into Bantham Harbour not on the prevailing SW winds, but on the much less frequent NE winds. One local report attributes some sediment movement to the effect of NW winds
19. In the last ten years there has been a noticeable amount of erosion of the cliff below Bigbury on Sea. This phenomenon may be indicative of a change in storm wave action across the flats of the Ham and may also be a source of sediment ingress. A local resident who lived at Junket on Cockleridge as a child remembers a sandy beach beside the groynes which now is rubble, owing to rock falls. The shore is less frequently sandy than previously but the cobbles on the beach are more rounded, suggesting more prolonged erosion.
20. During his talk on Old Thurlestone in Jan 06, Peter Hurrell described how when the Bantham Boat House was built in 1936, the workmen had to cut back the bank and the resulting debris was shovelled into the Harbour.
21. Collapse of the groynes at Cockleridge. These groynes were put in place by Captain Chick in 1930s. There were four groynes (two concrete and two timber, of which a few up-right spars remain). The presumption is that the groynes prevented the erosion of the Cockleridge shore under the impact of NW winds. The collapse of the wooden groynes commenced in the 1960s
22. A diver member of ACA recounts that when diving at the bottom of the Salmon pool, he was surprised to experience small rocks and boulders scouring the river bed on an out-going tide.

Infestation

23. *Spartina* Infestation. Some time in the last two decades of 20th C. *Spartina anglica* (Cordgrass) established itself in Were Marsh. *S. anglica* is a hybrid first detected in Poole Harbour around 1900 and was widely used to stabilise mud-flats. Once established it spreads on the tide and is almost impossible to eradicate. There is now an infestation at Mud Walls just below the established salt-marsh.
24. Onset of nitrogen pollution. Following our entry into the Common Market in 1974, farmers were encouraged by the MAFF to increase their yields by the application of large quantities of nitrogen. When surplus nitrogen (and phosphates) enters the water courses, it sets up a process of eutrophication or nutrient enrichment and floating weed proliferates. At periods in the summer, the navigation channel below the Tidal Road resembles the Sargasso Sea! It may be that this weed traps the silt.
25. In recent summers a green alga, similar to that which pervades the Kingsbridge Estuary, has started to appear on the east side of the lower estuary between Dixon’s Quay and the Boathouse. The cause is conjectural, possibly phosphates combined with high temperatures, but it is a hazard to outboard propellers and its presence will further enhance a tendency to trap silt on its way down stream..
26. Until about 20 years ago, Bantham fisher folk used to harvest seaweed in the summer months and market this as horticultural fertiliser. The harvest may have incidentally reduced the extent of silt retention in the summer period.
27. Phosphate pollution from Aveton Gifford has increased dramatically since the introduction of “whiter than white” washing powders in the 1950s, augmented by the increase in village population in summer months. Phosphorus is normally a limiting nutrient for growth in aquatic systems and the phosphate increase is contributing to eutrophication on the Upper Estuary. The ultra-violet screen on the sewage works has been effective in reducing microbiological pollution but has actually aggravated phosphate release into the river from microorganisms killed by UV irradiation.

Revised 05/04/2011