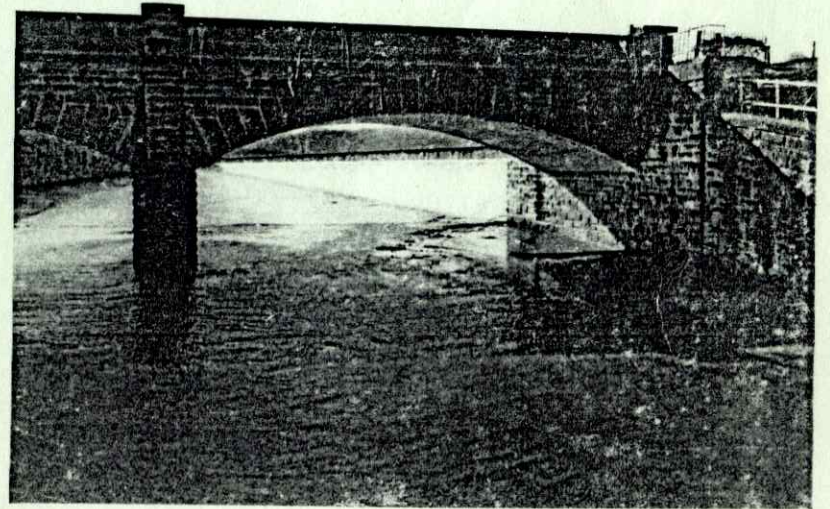


*Tales
from the
Waterworks*



Most of the rain gauges were fenced off to reduce interference by animals and humans, but at the open ones the quantity and colour were looked at more closely to estimate whether any extra "liquid" had been added!



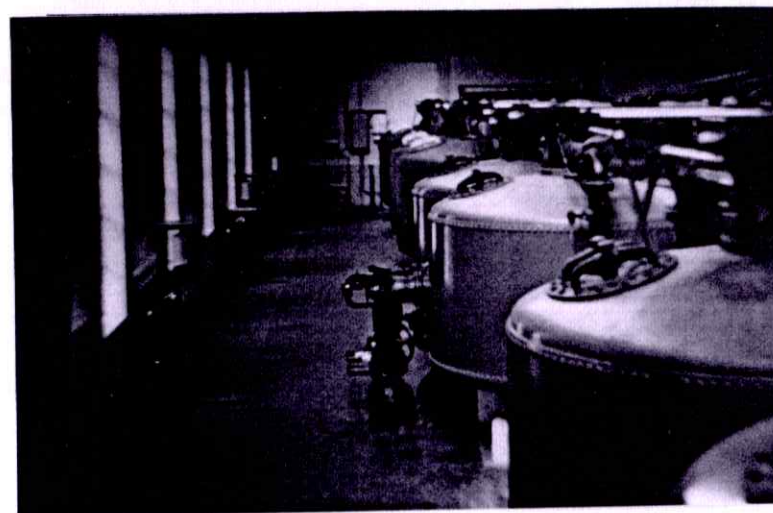
UPPER HALL rain gauge

I was introduced to the job at the waterworks by my friend John, who was a keen bird-watcher, and who had done the rain gauge checking before changing role to look after the sludge pumps. Waste muddy water from the filter cleaning process, was pumped up into the "Sludge Field" pools, then through a series of open trenches until it settled and dried out. Not a very satisfactory system because it encroached further into the fields, although it did make an interesting wildlife habitat.

I was 18, working outdoors with opportunity to bird-watch in the valley which I liked, and things seemed idyllic. Six to seven men were usually employed on estate duties which varied between grass cutting, weeding, fencing, tree felling, wall repairs and specific water course inlet cleaning and valve maintenance. On wet days in winter we did some cleaning in the filtration plant which was situated in a long concrete building below the dam. Water pressure from the reservoir (about 40 p.s.i.) forced the flow down through the sand filled metal filters, out through the main pipe and on by gravity to the underground service reservoir between Disley and Highlane. There was an additional supply from Goytsclough Quarry where the "High Level Tanks" held water piped from the main Goyt stream and Deep Clough collected by small dams which screened out the stones and shale silt. From the underground tanks, water was piped to the filter plant 3 miles down the valley, by which time it had built up a pressure of 250 p.s.i. This High Level Supply was filtered separately in 8 stronger, double riveted filters, and continued in a separate

12 inch pipe, to be pushed by gravity pressure to a different service reservoir at Higher Disley, from where it could then feed properties below without the need for pumps.

The high pressure water was also used in the filter plant to operate water hydraulic valves for the rest of the 56 filters. This was far more efficient and quicker than hand turning 3 valves per filter. The filter vessels were 8 foot diameter, enclosed steel drums, with 144 strainers set in the concrete base. There was a central metal shaft which could be rotated. This had horizontal arms with metal spikes protruding vertically. The whole vessel was $\frac{3}{4}$ filled with sharp sand which was too coarse to be lost through the strainers. The filters were washed daily when the water flow was reversed, this lightened the weight of the sand, and the shaft and arms could then be turned slowly by means of shaft, belt and gears. When filtering normally with water flow down through the vessel, Sulphate of Alumina was added, which formed a jelly-like layer on top of the sand, to take peat stain and fine sediment out of the "raw" water. This sludge layer is what needed cleaning off daily. After clean but slightly acid water left the filters, clear lime water was added to the main outlet pipe to bring the water to just above neutral pH, and chlorine was regulated to kill off any remaining bacteria, before the water flowed by gravity off down the main. The whole plant had been designed to operate on the rate of water flow and to adjust the chemical dosage as the flow increased or decreased. Constant manual checks were made throughout 24 hrs, 7 days a week. In later years I worked on shifts in the filter house. Chlorination of the High Level Supply was done separately using liquid Sodium Hypochlorite.

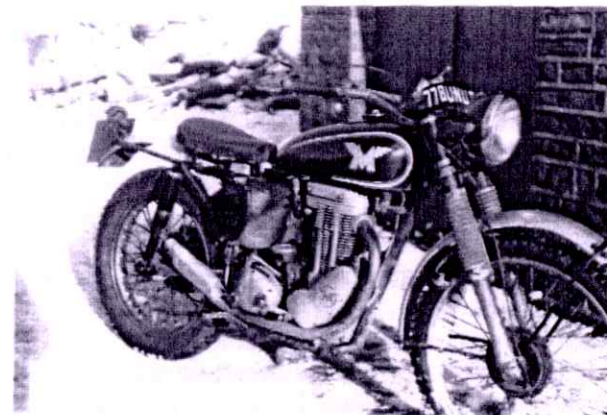


1959 was a hot dry summer lasting from March until October, and was one of the few years when the Sweet Chestnut trees at Errwood produced nuts big enough to eat. Fernilee Reservoir level dropped to 80 feet below top water line and water restrictions were in force. In early October 2 inches of rain fell in just over 24 hours, the streams swelled quickly and a mass of relatively cold water rushed into the warmer remaining "puddle" of reservoir, stirring the whole into a clay and mud mixture. The filter plant became blocked with a 3-4" layer of clay over the sand bed, and had to be closed down and drained. We had to open the manhole cover at the top of each filter, squeeze into the very restricted space and dig off the clay mud. Individual filters were put back into service even though we knew the same problem would occur again, and although the second cleaning was not such a thick layer, it had mixed more and took just as long.

The raw water colour was a yellowy brown and this affected the river quality as well. River compensation flow of 3 million gallons a day had to be maintained to supply industries like Edward Hall's Bleach Works 2 miles downstream. They were not happy with the water quality, but nothing could be done until the reservoir stabilised. Staff worked a night shift, and even Buxton waterworks employees came to help until the plant was able to operate at a reduced rate.

As the dry summer had progressed the stream flows had dropped right off, and this meant a shortage at the High Level Tanks at Goytsclough. We had to make frequent checks to ensure the tanks did not run dry and allow air into the outlet pipe, which could have caused a burst further down the line. This system was abandoned when Errwood Reservoir was constructed. The underground tanks however were retained to supply water to the public toilets in the valley.

The same problem of water shortage occurred during the very severe frosty weather of the 1962/63 winter. We took turns to trudge to Goytsclough, several times a day and sometimes in blizzard conditions. The snow drifts became firmer as the weeks went by, and ice on the reservoir eventually became 2½ feet thick. As the reservoir level dropped, the ice at the edges cracked and sloped dangerously. At that time I had a 350 cc trials Matchless motorcycle and used it on some days to get to Goytsclough, riding over the snowdrifts. Riding a bike in sub zero temperatures was a bone chilling experience!



1961 350cc Matchless model G3C

Quite a few of the men had motorcycles which over the years varied from a 1932 hand change 350 B.S.A., an early B.S.A. Sloper with sidecar, two nice Nortons (a Reg Dearden special Dominator and a Model 50, later changed for an E.S.2.), a smart B.S.A. Shooting Star 500 twin, a Triumph T100 twin with alloy engine, and an early B.S.A. Gold Star. I had graduated from a 125 B.S.A. Bantam, through a 250 Francis Barnett, to a 500 B.S.A. A7 before the trials Matchless. Freddy of 'story telling fame', had a Jowett Bradford van which gripped well in snow conditions and had a very characteristic engine sound.

"Angus" at the filter house was a born roadside mechanic and could get over most problems, even making a new bearing spacer for a speedometer drive by cutting a button into quarters and filing a quarter round, not too good for finger ends. After the B.S.A. Sloper, he had his first car, an old Ford Pop. followed by a smart black 6 cylinder Wolsley just like the police used to have, and then a green square type Morris Oxford.

Stockport Corporation vehicles were painted green, and weekly deliveries to the Filter House came in a 6 cylinder Bedford van. The driver was usually Charlie, who had his own caravette, and on a series of holidays he and his wife had travelled around the coast of Britain over a period of several years.

The weekly stores comprised chlorine cylinders (liquid gas), engineering spares and cleaning materials. One of the other drivers who occasionally came was Joe, who thought his job was just to drive and not help load or unload. One summer we cut down a large Sycamore tree when it was full of sap which ran out like a trickle of water. Using a cross-cut saw with short ropes on each handle, 2 men worked at each side. The trunk was eventually sawn into suitable lengths for planks and rolled, using crowbars plus wooden poles, off a grassy bank and over planks onto the flat lorry back. With the heaviest butt end of the tree on first, Joe was all for setting off saying that he had enough weight, but Johnny our foreman

insisted that he took a full load, and we rolled some more on. Rumour was that his wife had told a neighbour that when Joe got home at night, he was too tired to speak.

'Alum' came by contractor's lorries direct from Laporte's at Widnes and was quite often still hot when it arrived. It came as long rectangular blocks weighing about $\frac{1}{2}$ cwt, and we off loaded and stored it at the back, upper level of the Filter House, which was the 'Alum Room'. At the start of winter, a stock of about 30 tons was stored, some stacked at the lower end of the Filter House, just inside and to one side of the large shutter door, but this meant a second handling when the alum was eventually used. The manufacturing process at the chemical works, was Sulphuric Acid on Aluminium shale ore, and this produced the heat. Alum slabs were weighed, then put on elevated wooden trays inside concrete tanks which were filled with water. And then they were left to dissolve, stirred using a central paddle, and the liquid used over the following 24 hours. The relative density was tested using a twoddle hydrometer.

Hydrated Lime came from the Buxton area as powder in $\frac{1}{2}$ cwt paper sacks. Dowlow Quarry had the contract for many years and the regular driver Jim, was skilled in getting his flat back lorry close to the door. He had an E.R.F. lorry with exhaust assisted brakes which made a very distinctive vibrating sound, giving due warning of his imminent arrival down the steep road. Lime in dusty powder form was poured slowly from the paper sacks into a large tundish funnel, feeding into a 6" diameter flange in the top of the deep round metal 'Lime Tanks', which were then filled with water. Newly charged lime tanks had to be carefully watched and checked frequently when put into service, to make sure they didn't stir up milky coloured and therefore too strong. The idea was to have clear lime water with a steady pH, mixing with the filtered water outlet.

The Filter House building was a reinforced concrete structure which I remembered as camouflage coloured from the war time, then in the early 1960's it was painted cream before becoming khaki and grey some ten years or so later. The concrete started to flake exposing the metal reinforcing bars, and the outside was patched up, but the roof was done properly with new glass incorporating safety mesh as well as covering the concrete part with lima asphalt. The ceiling inside was given an asbestos insulating layer by two wiry chaps from the North East. Scaffolding was put up so they could reach easily, and a fluffy asbestos mix was blown up directed by a narrow pipe joined by a jet of water spray just before it hit the roof. By some miracle it adhered to the ceiling. The two workmen would then press the mixture smooth and to the right thickness with large wooden floats. The men wore respirators, but one chap had cut a hole in his so that he could smoke!

The middle section of the building had 3 floors; a cellar which housed the heating boiler and gave access to the valves at the base of the lime tanks which reached up through the whole building, a middle section to operate the flow control valves on the lime tanks plus some workshop space. This middle section also originally housed the water turbine which could turn the shafting system or generate the early 110 volt electricity supply, and there was a stand-by diesel engine. When mains electricity was installed the old methods became redundant, like so many things. The top floor was the 'Alum Room' with 4 square concrete alum tanks, the tops of the 6 lime tanks, storage space for lime and alum and a small metal tank with a manually turned paddle which mixed up fine limestone dust to a thick chalky liquid, used only when the raw water colour was very peaty. It brought up the pH so a strong dose of alum would be used to clear the stain. Also on the top floor there had been a bank of acid storage batteries used to store the 110 volt power for night use, not particularly good lights as the night wore on.



In addition to the 3 shift attendants there was a day man who dealt with filling the chemical tanks, cleaning and generally helping. When I first started, Fred Wilson was the day man and he worked until he was 72!



He walked from Fernilee village where he lived in cottages by the Shady Oak (now part of the pub). He was always early in the morning, came in by the top door and opened up an air valve on a lime tank ready for later, before coming down the circular concrete stairway to the messroom for a brew. I think I secretly imagined that we worked in a lighthouse, and although there were no sea birds on the horizon, the bird list from the front door was pretty good with over 70 species spotted.



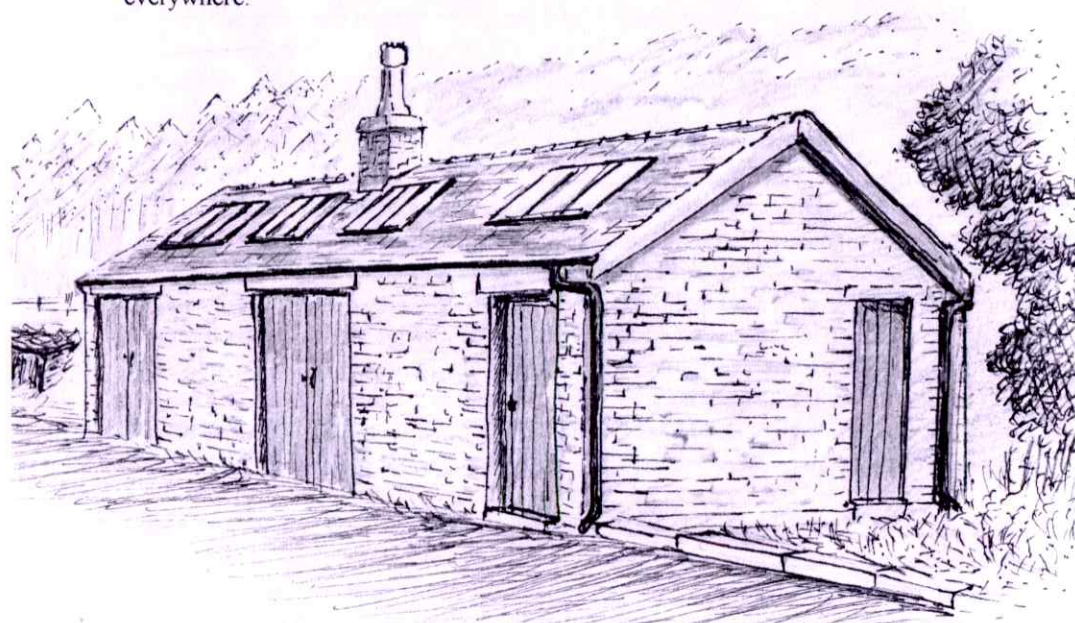
June Sidebottom with Pip and Fred Wilson near the bottom of Errwood drive at the site of the old schoolhouse

Fred Wilson had a long association with the valley having lived at Stubbin Farm and as a lad worked at the Gunpowder Works. One of his sayings, once a year or so was, "My father would have been 107 to-day, had he lived!" When Fred retired, 'Little Jim' took over his job, moving in from the outside crew. Jim also had a long involvement with the valley, having lived at Goytsclough Quarry Cottages when his father worked the coal mine at Errwood Hall (1911-1917). The family then moved to Goyt's Moss Farm at the Derbyshire Bridge end of the valley. As tenants were gradually pushed out of the impending reservoir catchment, they moved to Kettleshulme in 1928. Goyt's Moss Farm was 108 acres of very marginal land and with mining blood in the family they were always trying to find coal. They dug small amounts from under the exposed shale banks, but then dug a 65ft shaft near the house, to try and reach the old bell pit levels. During the 1926 strike period they linked up with some Yorkshire miners and opened an adit near the bottom of the minor road to the Cat and Fiddle. They just got into the coal seam as the strike was called off.

Jim had a good memory and related how he helped his father to clean out the well at the Cat and Fiddle Inn in 1926, for a fee of £16. The well was 96 feet deep, with the top 12 feet through peat where it was lined with stone, then 70 feet through rock and the bottom 12 feet into shale, the water level reaching the top of the shale layer. 13 old buckets were found at the bottom of the well from the times when an old double bucket winch had been used, this was to be replaced with an

electrically driven bucket chain system. In later years the outflow from the pub waste drainage tank had a 'Hypo' drip which needed checking and refilling, to chlorinate water reaching Deep Clough and into the reservoir catchment.

Back at the Filter House in the messroom there was a solid fuel stove which heated the cast iron kettle/urn. Everyone had their own methods and Jim always brewed directly into his green enamel mug which was permanently black on the inside. On the whole, staff were very loyal to the job and had to be really ill to stay off work. In my early days the base for the 'outside gang' was the Cabin, a single storey stone building which was probably erected at the start of the war together with 2 air raid shelters. Here we had another messroom, a simple workshop, and some storage space into which we managed to squeeze several motorbikes during the daytime. One of the ongoing jobs when I started was re-fencing the 'Valentine' driveway with a split oak fence down either side. This involved felling the trees, extracting the sawn trunks from the wood, quite often on a slope, and loading onto the Ferguson tractor trailer to be taken to the Cabin. The only works transport we had was a grey petrol Fergie with trailer, and this would also take men and materials on jobs further up the valley. If we were working out for any length of time we fitted a canvas sheeted frame shelter which could be manhandled on and off, plus a drum brazier for boiling the kettle, that essential utensil carried everywhere.



The Cabin

Oak trees were felled, the trunks trimmed, cut to length and rolled or dragged to the trailer. The cut sections were rolled up planks to be trailered away, usually to the Cabin. Felling was done with a cross-cut saw and axe, and the trunk sections split with steel and wooden wedges following the natural linear cracks in the grain. Straight trees were chosen to produce the rail lengths needed and the sections were split several times to achieve the thinness of rail required. A lot of trimming was done indoors on wet days, where we would have a good fire in the Cabin grate, and with Freddy's endless stories, many a winters afternoon passed tolerably well.

Horace who was in charge at Fernilee had been born and bred into the waterworks as his father had been at Kinder Reservoir since it was built. He lived in one of the two reservoir houses and seemed to survive for long periods on nothing but a cup of tea, cigarettes and a lot of coughing. Although committed to the job, he also put 100% effort into any hobbies he started which included, model engineering, photography, art painting, various vehicles and a canal boat. He had a Zundapp scooter at one stage, which must have been very well made to stand the full throttle use it received. At least it gave good warning of Horace's impending arrival.

One day he asked me to help him sweep the house chimney which you may guess was to be by unorthodox method. He put ladders up to the roof, climbed up to the chimney and dangled a length of chain on a wire down the flue. I was inside with instructions to shout when any soot came down. His prior precautions around the fireplace had been to place a metal draw tin with a newspaper behind, propped with a poker against the fireplace opening, Nothing had been removed or covered around the hearth. We were ready, and Horace began poking around in the chimney, "anything happening?"

"No, nothing",

Rattle, rattle, "Anything?"

"No..."

"Stop! Stop!"

There was a soft whoosh as a cloud of soot escaped in a sort of fan shape from three sides of the draw tin. A narrow ridge of soot trailed along the tiled hearth covering whatever objects had been left out, partially filling several pairs of ladies shoes, up and over a chair arm and onto the cushion. Horace rushed in with a stammered "Oh ruddy hell", he grabbed the upright hoover and held it in the grate sucking up ashes as well as soot. As I poured soot out of the shoes he said "I think you had better go, the wife will be home soon". I had difficulty stopping laughing, and later heard raised voices from the house.

In Stockport Corporation Waterworks' days there was annual inspection by the waterworks' committee and everywhere was cleaned, brushed, weeded and trimmed. In the Filter House the floor plates were blacked and the brasses extra polished. In the summer I also looked after the lawns and gardens at the front

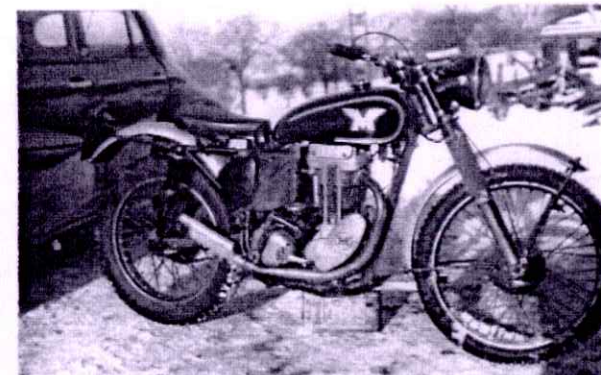
where we had dahlias and geraniums, and for the inspection hanging baskets were sent up from the Parks Dept. One summer Horace had us take the set of Slingsby ladders to the western end of the dam so that he could try and take some elevated photos of the Filter House. The ladders were wedge shaped and pulled up into a pyramid form reaching 40 feet or so, but he didn't achieve the aerial views he expected.

We also had visits to the works by schools and adult groups who were sometimes taken from the valve tower through the shaft and tunnel and out at the bottom of the dam. The shaft at Fernilee has metal vertical ladders between the floors and Health and Safety restrictions would probably prevent non-employees from going in now. Two pipes come out from the Dam, one to feed the river and the other to supply the filter plant, with inlets at 40', 80' and 120'. With a full reservoir the 40' inlet was used unless the raw water was very brown.

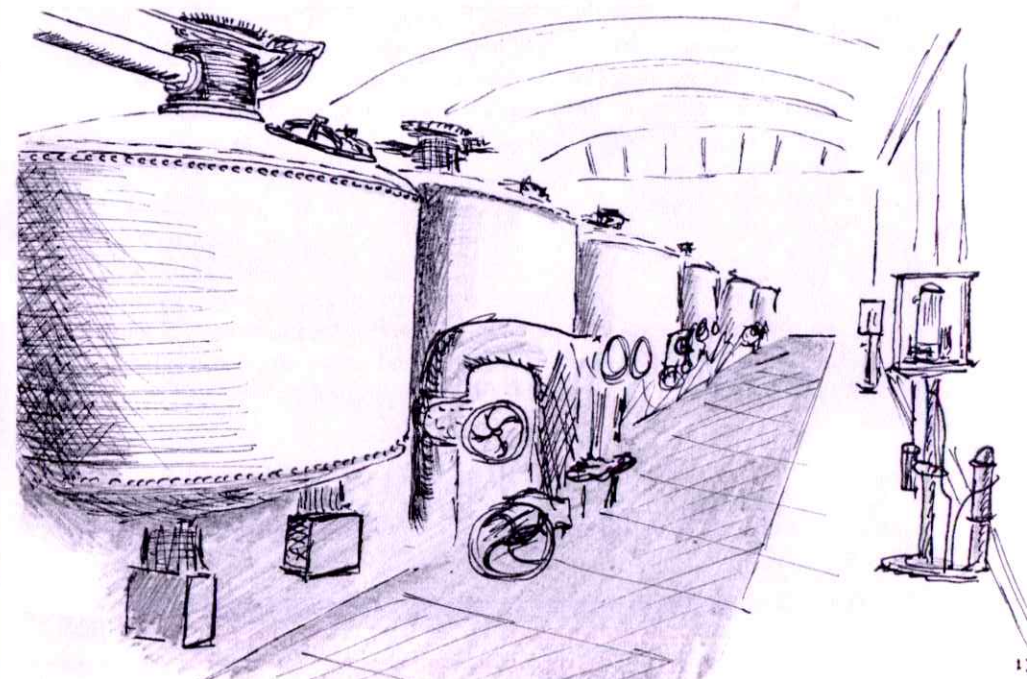
The severe winter of 1962/3 caused lots of problems and lasted from the Christmas period right through until a thaw on March 3rd. Easterly winds blew snow from the fields into long drifts behind the sheltered sides of walls and any natural wind breaks. Longhill road was blocked just past the waterworks' entrance and even Fernilee village was virtually cut off for a while. With the trials Matchless I could ride around the edges of the drifts but at one stage even the bottom of the Valentine drive was blocked and we had to dig through. Workmates with road motorcycles managed to get through but with more difficulty.



Dave, John and Len



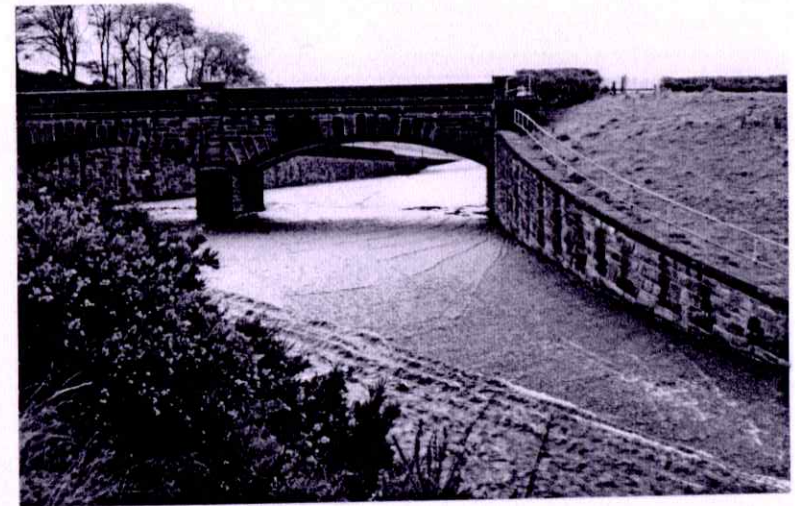
This particular bike had no air filter on the carburettor and was difficult to kick start in the extra cold conditions. The weeks of continuous severe frost hardened the snow, froze domestic water pipes and some water mains, and of course this was the time when the Filter House central heating boiler broke down. A difficult building to heat in normal cold weather, in the constant sub zero temperatures problems got worse. Virtually all the water filled sight glasses froze and cracked, and a layer of ice developed on the inside of the concrete walls. We fixed clear plastic 'skirts' around each of the water flow meter clocks and wired an electric light bulb inside to provide a low heat source. The clockwork meters sat on cast metal stands and operated on a system of water flow pressure against mercury with thin copper pipe feeds. They were protected by square wooden framed glass cabinets which had a front opening door to give access to the recording charts (changed weekly) and the winding mechanism for the pendulum operated clocks.



The waste water tanks just below the filter plant, the Wash Tanks, is where the sludge water settled before being pumped up to the sludge fields. Over the 24 hours following washing out of the filters, the muddy water settled, and the top clean layer was gradually decanted into the river. Long hinged tubes with floats at the top, dropped slowly and had to be watched carefully to make sure that no sludge was sucked in and through to the river. Patience had to be exercised in gradually opening the valves at the start of full tanks, otherwise air would be drawn into the tubes and they would lift out of the water. If that happened, a long piece of timber was used to push the tube end back under water, and held until it filled again.

In the early days there were only 48 filter shells, with the additional 16 being fitted in the mid 1960's, to presumably link with the finishing of Errwood Reservoir. These later filters were of welded construction, whereas the older ones had riveted joints. At this time 4 filters were washed out together, and the high pressure water operated hydraulic valves, made the job easy. With limited wash tank space, washing out time was limited to about three and a half minutes to each section. We washed out at roughly the same time every morning when distribution staff at Disley closed valves on the inlet to the service reservoir. We knew when to start as the filter flow meters dropped down, and we had to complete washing in about 1 hour 15 minutes to be set up for filtering, when the demand came on again. One slight flaw was that three and a half minutes didn't quite get the filters clean and they went back on service without being fully clear. In later years, filters were washed individually using the hand valves over the whole day period, and the plant wasn't closed down for washing out. A polymer coagulant was also added to speed up wash water settling, so there was always room in the Wash Tanks.

Well, the once weekly delivery van expanded to more vehicles, as staff came up from Stockport to carry out maintenance work, and the colour changed from green to blue, as Stockport Corporation Waterworks became Stockport and District Water Board. This was the beginning of the end of anything resembling an old estate, and soon experimental engineers arrived on the scene and the filter staff were issued with white overalls! It didn't last, and we reverted to the more practical shade of blue. The familiar hum and sound of water under control known to experienced ears was shattered with alarm bells and sirens, alerting problems with chemical flows, bringing an unsettling atmosphere and less job satisfaction to the place.



On the flat grassy area near the dam at Fernilee, there used to be flagpole which was painted white, and for waterworks committee visits and other special occasions, a union flag was raised. With grass edges cut, roads swept and weeded, the place did look tidy giving sense of estate standards.

Although farms in the valley had only been demolished for 30 years, many areas had grassed over, and to anyone like myself who had never seen the buildings, the time span could have been much longer. Even another 40 years hasn't made a noticeable difference.

At Fernilee dam there is some very fine stonework, particularly on the overflow spillway. This presents a fascinating sight when flooding over with 100 million gallons per day discharging into the river.



After the 1959 drought, plans were put in hand to drill the 2 boreholes in the valley downstream of the filter plant, which would be able to produce an extra 2 million gallons a day when needed. "A" bore was about 375 feet deep, and "B" bore was about 425 feet. The stone cores can be seen in the riverbank, just upstream from Hillbridge. An idea to dam Ladbitch Hollow and pipe water around the slope was surveyed but never implemented.

The next move was to start construction of Errwood Reservoir. Ever since Fernilee had been built there were plans for a second dam further upstream, and a pipeline had been laid along the valley floor ready to connect at Errwood when that was constructed 30 years later. The new dam cut off the tip of Fernilee, where spanning the southern inlet there used to be a metal suspension footbridge, which linked the path crossing the former Cromford and High Peak railway at Bunsal, to the other side of the valley near Errwood Farm.



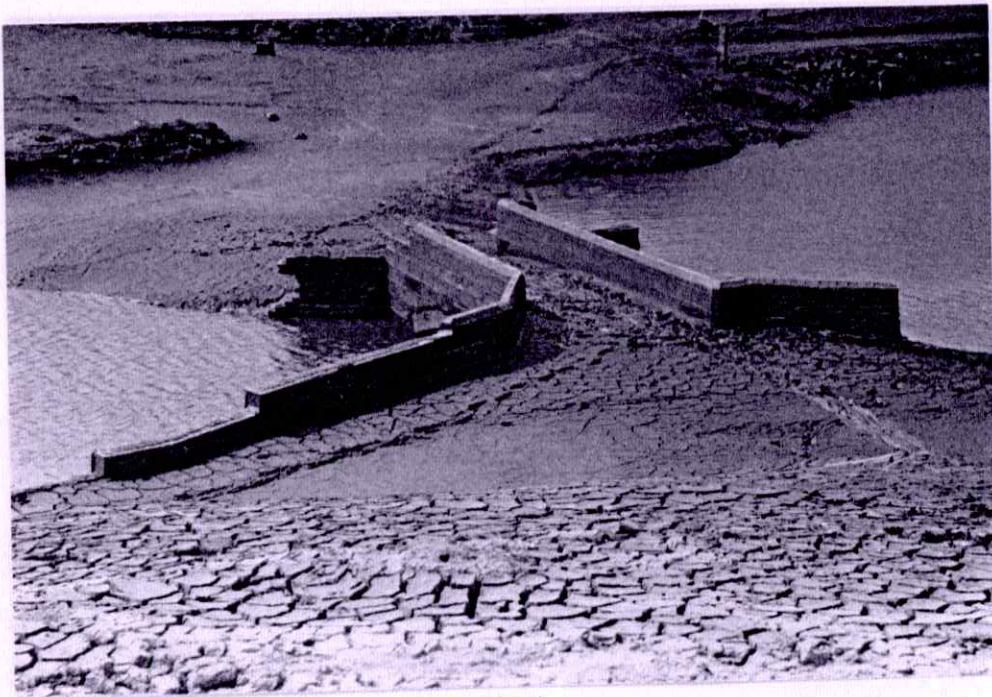
The old stone arched bridge over the railway is still in place, but underfilled with soil. The Midshire's Way path has adopted the route past the former sheepwash and up to Longhill. The Suspension Bridge was originally painted green, but became an unfriendly white in the 1960's, before being demolished in 1966 as Errwood Reservoir construction got underway. It's position was right at the foot of the present Errwood embankment.



early 1966

It had been fairly well maintained with the support cables greased, and a check kept on the walkway grill plates which covered the span of about 80 yards. Young people used to get the bridge swinging by pulling on stays linking cable to bridge side, so Horace organised the fitting of metal loops which limited movement on the stays.

Further upstream the original stone road bridge at Goyt's Bridge, is still in position under Errwood Reservoir, and does re-appear during very dry summers. Modern maps show Goyt's Bridge to be at Goytsclough Quarry where the smaller packhorse bridge was re-constructed.



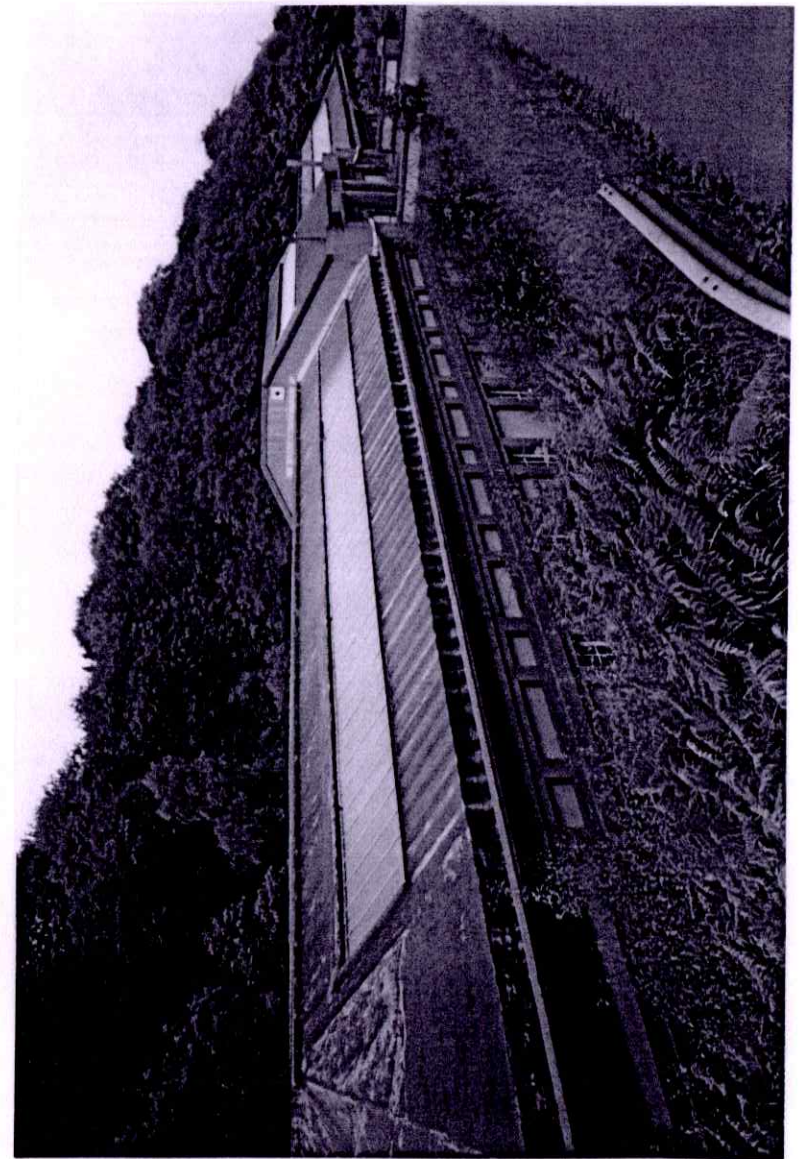
July 1984

Changes in the 1960's meant an end to a quiet period in the valley's history and a change in its landscape. A new road to Errwood Reservoir gave access to extra vehicles and visitors, sailing and fishing were provided for on the water, and the Forestry Commission started planting new woodlands on the western side.

Modernisation at the filter plant replaced water power with electric motors to turn the filter shafts, pumps to move water on the High Level Supply instead of gravity, pumps to feed in chemicals instead of the venturi flow system, liquid Alum to replace blocks and a sludge press to deal with the waste. Even all this was to no avail, as a new filter station near Highlane has replaced the Goyt, Kinder and Lyme Park works, and the filter plant at Fernilee was shut off in July 1997, after its 60 year working life.

Looking back, I'm glad to have been involved with the valley during one of its quiet periods and before recent changes, and had the opportunity to enjoy sights like Black Grouse displaying at the 'lek'. Visitors to-day will have their own experiences, but will have missed what I remember as better times.

Geoff Howe Dec. 1998



June 1998

27th October 1998

