Hosey Caves Westerham

RCC OXFORD 2010

Hosey Caves, Westerham

Every boy that ever went to Hosey Boys School Westerham, Kent would have known about the ‘Caves’ on Hosey Common, many would have explored them. In fact they are not natural caves but stone quarries and although they are so well known and have been explored by boys and caving enthusiasts alike and have been comprehensively mapped almost nothing is known of their history, who dug them, when they were dug and where the stone was used. It is the purpose of this study to try and answer some of these questions.

Some early visitors to the caves c1920

The study discusses the geology of the caves, their exploration and surveying and their archaeology. It then goes on to study how the stone quarried from the caves was used in the building of Westerham. The stone has been quarried and used for buildings in Westerham since at least the 12th century and building boomed in the Victorian era. The study suggests that over 20,000 tons were quarried over 800 years. By examining the census, the study suggests that while stone masons moved into Westerham during the Victorian building boom, once the boom passed they moved away and Westerham never acquired a tradition of stone building. The quarries fell into disuse and today are sealed off, designated a Site of Special Scientific Interest and home only to five different types of bats.

Location and access

The ‘caves’ can be found on the east side of a dry valley (Grid ref 454531) just east of Hosey school on either side of the French Street Road and they extend for a total distance of approximately 530 yards from north to south. There are currently seven exposed entrances, though all of these are blocked either by locked gates or small grills. Access to the caves by human visitors is denied in order that colonies of rare bats can hibernate without disturbance.

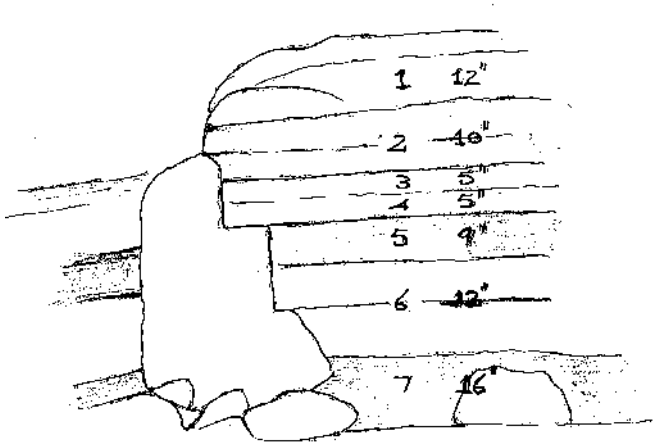
Entrances blocked with gates and grills

Geology

The caves are dug into the Hythe Beds of the Lower Greensand. The Hythe Beds are brought near the surface in this area by the upfolding and subsequent eroding of the Weald anticline. The strata that the quarrymen were after were only a few feet below the surface. They had first been worked as surface pits in the side of the dry valley mentioned above, as the surface deposits were worked out it was necessary to go underground. Fortunately the beds are almost horizontal and so level tunnels or adits could be dug to follow the seams.

It can be seen from the photograph and diagram below that there are several layers present in the vertical section of the tunnels

A typical vertical section of a tunnel



Layer 1. Firm and compact grey sandstone with dark brown specks (manganese)
Layer 2. Soft and friable buff sandstone with similar specks
Layer 3. Firm and compact buff sandstone with few specks
Layer 4. Similar to layer two but much harder
Layer 5. Very hard grey/green sand stone with specks
Layer 6. Very hard buff sandstone with few specks
Layer 7. Very hard grey/green sandstone similar to layer 5 but more friable

The best stone for building purposes was the stone that came from layer 7. The quarry men called this 'Grey building stone' Layer 5 was also used and this was called 'Building stone', neither of these two are true ragstone as they contain no lime. Layer 2 was known as 'Hassock' and was too soft for building work. Poorer quality stone was used as road stone or for rough work such as garden walls.

The method of working

The method of quarrying was that known as 'pillar and stall' In this method several horizontal tunnels or adits roughly ten feet wide and six to seven feet high were driven in from the vertical rock face. At intervals cross passages were cut to link the main passages and to remove as much useable stone as possible while still leaving stout pillars to support the roof. There is no evidence that any other roof supports were ever used at Hosey. All the extraction was by hand. There are plentiful pick marks on the sides and tops of the tunnels and no explosives were used. The quarrymen deposited large amounts of waste rock (deads) in the worked out areas reducing the roof height in many places to only a few inches. This was an economical method for disposing of waste in that it only had to be carried a short distance and did not mar the surface with large spoil heaps.

Tram ways were not used in the quarries and the tunnels were too small to admit the use of horse and cart. In one of the tunnels (Series 2) there is evidence in the form of ruts about 15 inches apart of sledges being used to move stone to the surface.

Removal of the quarried stone from the site would have been by horse and cart. There are several cart tracks up the valley and one very substantial causeway across the valley.

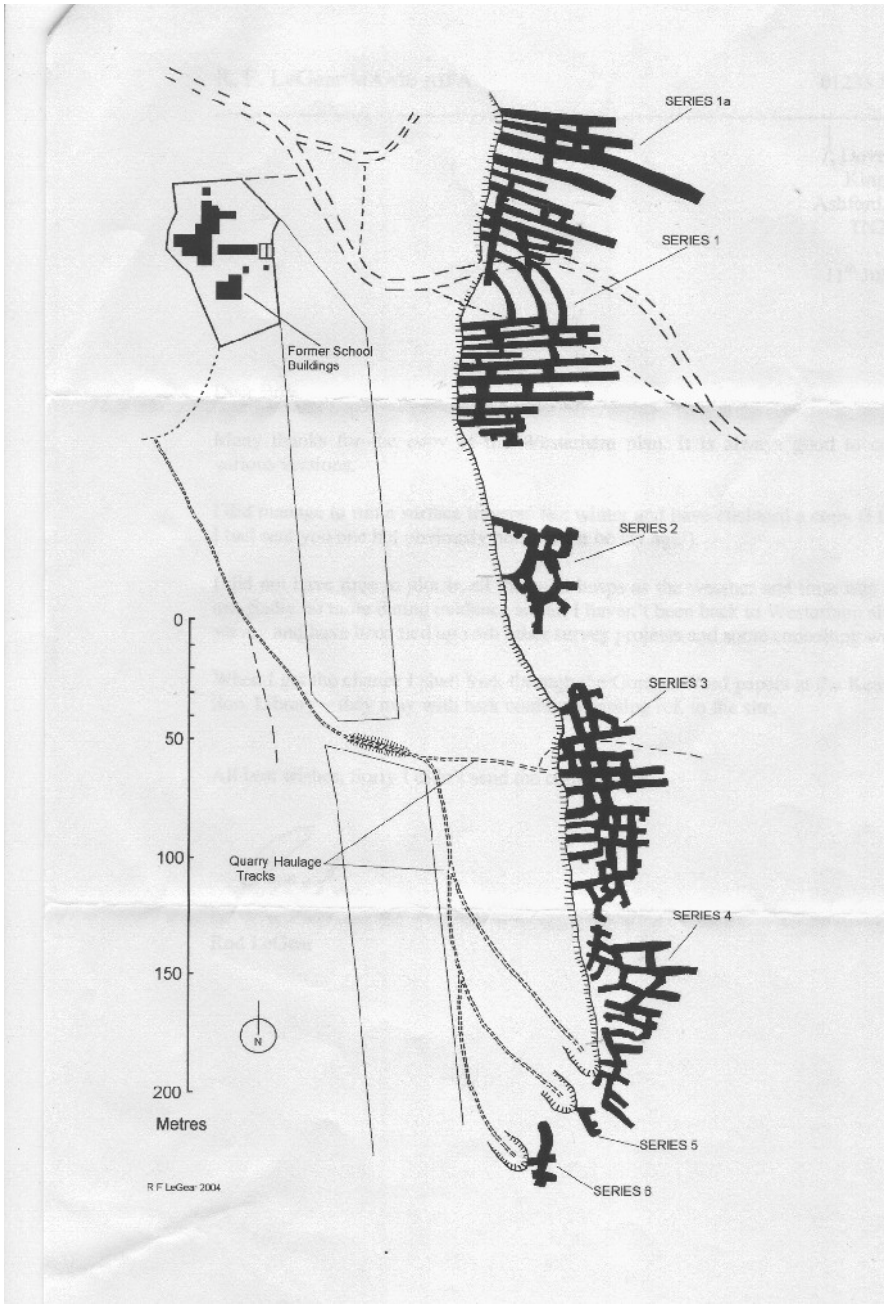
The causeway looking west

On the right hand side of the road leading to Edenbridge from Westerham is a very deep old track known as a ‘hollow way’. It must have taken a great deal of very heavy traffic to cause this amount of wear and it seems likely that this traffic was heavy carts loaded with quarried stone from Hosey.

Surveying the caves

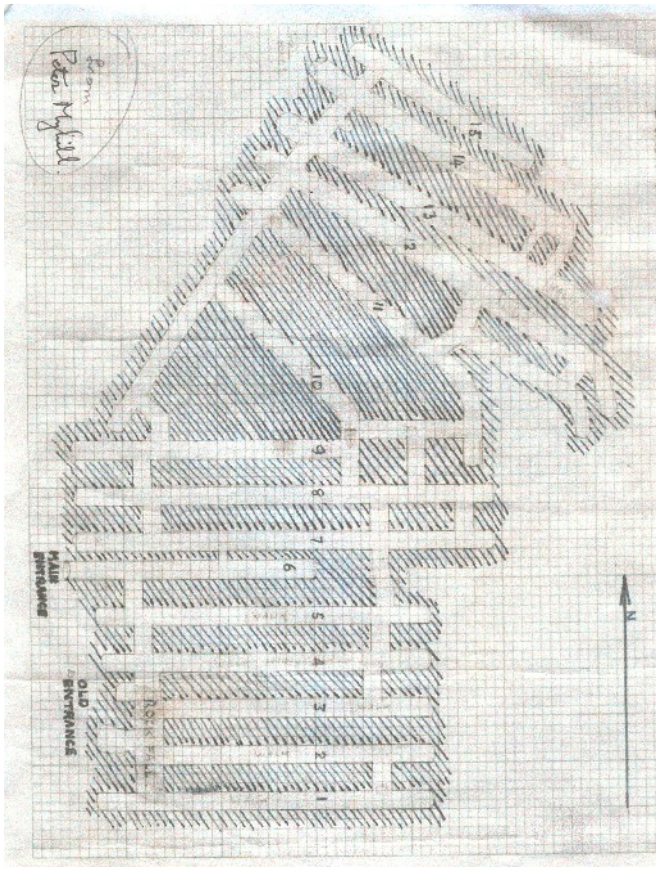
A number of individuals and organisations have made surveys of the quarries over a fairly long period of time. The first recorded one was by Birchby, Peet and Rumbold in 1939. This became known as Series 3 when Rod LeGear and members of the Kent Underground Research Group (KURG) mapped the whole system in 2004.

For ease of reference KURG used a numbering system to identify the discrete series of workings. Series 1was immediately south of the French Street road and Series 2 and 3 a little further south. Later when another group of tunnels to the north were found connected to Series 1 it was decided to call them 1a. As the work of surveying progressed in a southerly direction Series 4 was added and finally Series 5 and 6 were located and surveyed.



Plan of the complete system and some surface features by Rod LeGear 2004

Another very credible plan of series 1 and 1a was made in 1956 by old Hosey schoolboy Peter Myhill.



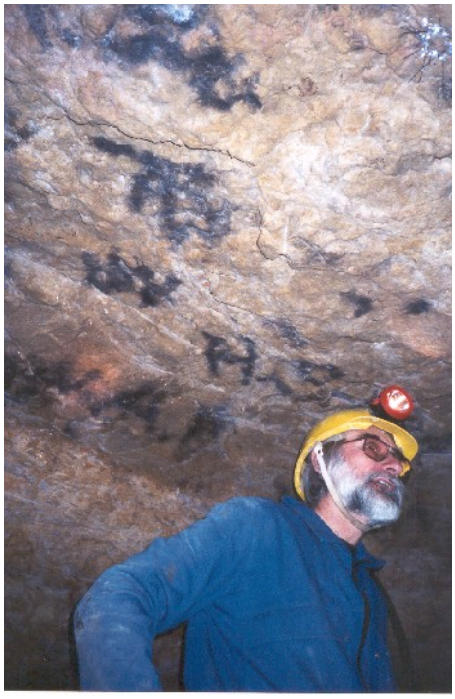
Series 1 by Peter Myhill 1956

By 2002 all the known tunnels had been mapped and KURG then set about finding a number of lost tunnels at the extreme southern end of the system. They succeeded in locating and excavating the entrances to two more small quarries which appear to have been closed up for a long time as no recent artefacts or graffiti were found in either of them.

Rod LeGear (on the left) and members of KURG digging out Series 5

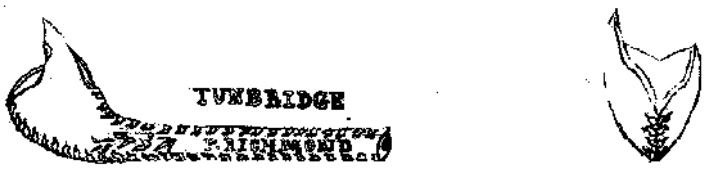
Archaeology

Almost no archaeology has been carried out in the quarries with exception of a very limited dig that Rod LeGear in association with the Cantium Cave and Mine Rescue Group did to uncover the sledge tracks in Series 1. It seems unlikely that much more evidence could be recovered using the archaeological method. There is a considerable amount of graffiti on the roofs of the tunnels, almost always in the form of initials and dates made with the smoke of candles. Given that the caves were open and unused for so long, this is most likely to be from casual visitors and Hosey school boys.



Graffiti in soot

Another form of graffiti was found in a couple of places: the remains of beer bottle labels stuck on the side of some tunnels. One group is from the brewery of Bushell Watkins and Co who was producing beer in Westerham from 1897 to 1899. The other group is Martin and Co who was brewing between 1867 and 1882. When KURG was surveying Series 4, a clay pipe dated to c1845 was found but whether these artefacts were left by quarrymen during their work or by casual visitors it is impossible to say.



Clay pipe from Series 4. Made in Tonbridge, Kent c1845

Local buildings

As Hosey is the only known source of building stone in the locality it is reasonable to suppose that the bulk of the material for stone buildings in Westerham came from the quarries. This study proposes that if the buildings were dated this would give a very good idea of when the quarries were worked. It also suggests that if the tonnage could be estimated that would give an idea of how much stone was extracted at any particular time.

Stone buildings in Westerham

The earliest stone building is St Mary's church, started in the 12th century extended in the 14th and 15th centuries renovated in the 19th century and the Fryth Room built in the 20th century.

The base of the church tower

The oldest part of the church is the base of the tower and this is un-coursed in a mixture of stone that looks as though it was scraped up from wherever it could be found.

The next dateable building is the Colltherst's Almshouses on Vicarage Hill; this was built in 1572 and rebuilt in 1970.

The gable end of Colltherst. Note the various types of rock

Although rebuilt in 1970 most of the stone used would have come from the original building and like the church, is in a variety of stone.

The Tower in Tower Wood was built c1735 and as it is now just an open ruin of four walls and a staircase tower, the stone used can be fairly accurately estimated at 317 tons. It may be significant that Series 5 and 6, the nearest quarries, together would have produced about 300 tons of the best quality building stone. After the building of the Tower until the beginning of the 19th century no significant stone buildings were erected in Westerham.

The 19th century stone building boom in Westerham started in 1828 with Hosey School. Originally the school consisted of a Headmaster's house in the centre with a boys department on the southern side and a girls department on the north. The girl's school was later pulled down and the stone may have used to extend the boy's side. Extensions were made in 1873, 1892 and 1899.

The headmaster's house 1828

Although un-coursed the stone all came from the same source.
The last extension to the school was carefully constructed in polygonal finish.

The latest extension 1899 quality masonry

Leaving the town along the Croydon Road are two more stone houses, one is Cathedral Cottage which is dated 1837. The other is Bishops Cottage which is dated 1842. Both were built by IWL. It is not known who IWL was but the quality of the masonry in Cathedral Cottage is of a high order.

Cathedral Cottage 1837. Note the squared block work

There is a row of almshouses in New Street that have a plaque on them that says that they were built by Arthur Willard in1623 and rebuilt in 1684 and again in 1970. This is puzzling as New Street did not exist until the 19th century. An OS map of 1870 shows New Street with the alms houses marked. I can only suppose that these houses must have been originally erected elsewhere and re-erected in New Street some time

in the 19th century and that the plaque is inaccurate. The style of building is certainly Victorian.

Willards alms houses. Polygonal work

The other stone houses in the street are all Victorian. One pair opposite the alms houses have a plaque that names them Alma Cottages with the date 1859. (Battle of Alma, Crimea 1854)

Alma Cottages

The next large building to be erected was the Drill Hall in 1865. This was originally built as a village hall but seems to have been turned over to military use fairly early. This quality of the masonry in this structure is good and again is polygonal work.

Drill Hall Note the polygonal stone work

When the girl's new school was built in 1861 it also contained a school for infants. It is not known how many pupils could be accommodated at that time but when the school was enlarged in 1889 at a cost of £1,000 it could take 120 infants and 160 girls, clearly this was a larger building than the boys school.

St Mary's girl's school

In Croydon Road there is an oast house that was built, between 1867 and 1897, the oast is of brick but the ground floor of the adjacent barn is stone.

When Moreton Alms houses were built in 1874 they were fairly extensive and estimating the stone used is difficult but could have been as much as that used in St Mary's school. It must be noted that the quality of the masonry is very high and probably accounts for the £3,376 that these alms houses cost. An article in The Architect of 1874 states that 'local sandstone' was used in their construction.

High quality work in Moreton's

Although they have now almost completely disappeared, the gas works built in 1887 used a lot of stone.

There are several houses on Hosey just opposite the school. These are certainly 19th c and like the alms houses in New Street are of fairly light construction but would still have used many tons of Hosey stone.

The last stone house is the one on the green called the Owl house, originally the stables and coach house to the Breaches.

The Owl house

It is noticeable that while the church was the first stone building in Westerham many of the other buildings have a relationship with religion. The Colltherst Alms Houses were built using money from a religious trust as were the New Street Alms Houses. Both of the schools were church schools. The Moreton alms houses were paid for by Miss Moreton, the daughter of the Rev William Moreton Moreton. Miss Moreton was a member of the Sisters of Clewer, a religious body founded in 1849 by Mrs Tennant

at Clewer near Windsor. The two houses in Croydon Road have no known connection with religion except for their names and in the case of Cathedral Cottage, its style of architecture.

Calculating the tonnage of stone used in buildings

If the length, breadth and height of the building were known or could be measured together with the thickness of its walls then the total volume of stone used could be calculated. Deductions for the various openings such as doors and windows would have to be made. If the volume arrived at is then multiplied by the weight per cubic foot of stone then an approximate figure for the amount of stone used in the building could be calculated. Where it is not possible to measure the building a guess could be made using such means as the length of parked cars, counting courses of bricks, using the height of bystanders etc. All of the buildings in the table below were measured or estimated in 2009 and 2010. The weight of Hosey stone is approximately 160 pounds per cubic foot. While it must be admitted that these methods are not precise, it does make it possible to arrive at a 'ball park' figure.

Building	**Estimated Tonnage**
The Church	5,000
Colltherst Alms houses	100+
Tower	317
Hosey School	250
Cathedral Cottage	125
Bishops Cottage	125
Houses in New Street	400
Drill Hall	500
Girls School	500
Moretons Alms houses	500
Gas works	200
Houses on Hosey Common	300
Oast house	70
Total	8387 tons

Of course in addition to the buildings mentioned which together total over 8,000 tons there are many yards of garden wall and retaining wall, steps and stiles that together may have used as much stone again as all the buildings. It would probably be not excessive to say that Hosey quarries produced around 20,000 tons of stone over a period of some eight hundred years.

Another method of estimating the quantity of stone taken from the caves for building is by measuring the total length of the excavated tunnels (5,850 ft) multiplying this figure by the average width of the tunnels (10 ft) and then multiplying this figure by the thickness of the two layers of good building stone in the tunnels. (2 ft) The figure arrived at by this method is 8,500 tons which accords very well with the figure arrived at above but it must be remembered that it has been postulated that the 5,000 tons used in the church most probably did not come from underground, so the difference

must have been used elsewhere, possibly sold to nearby villages that did not have ready access to suitable stone.

Dating the quarries

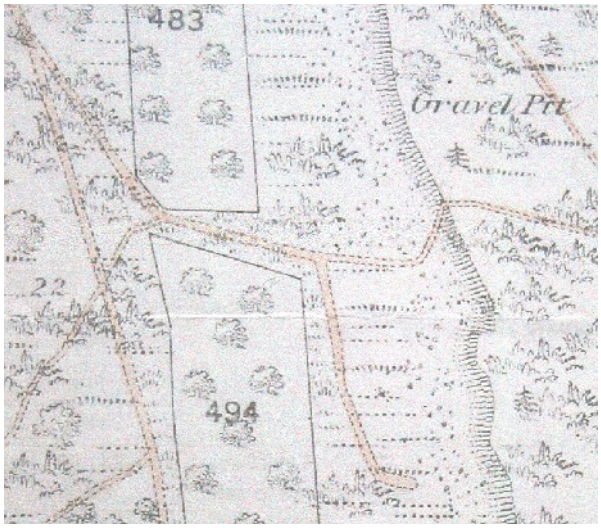
Lacking positive documentary evidence it has been necessary to use dated Ordnance Survey maps to date the quarries. It has not been possible to accurately date the quarry tunnels or adits but by the use of several pieces of external evidence it may be possible to make a reasoned guess.

The stone for the church and the early alms houses almost certainly came from opencast pits along the eastern side of the dry valley mentioned on page one. These pits were probably buried under spoil from later workings.
As already mentioned, Series 5 and 6 produced about 300 tons of good quality stone and that is just about the right amount for the Tower which is only 670 yards away. These two small quarries were completely unknown until Rod LeGear and his team rediscovered them in 2003.

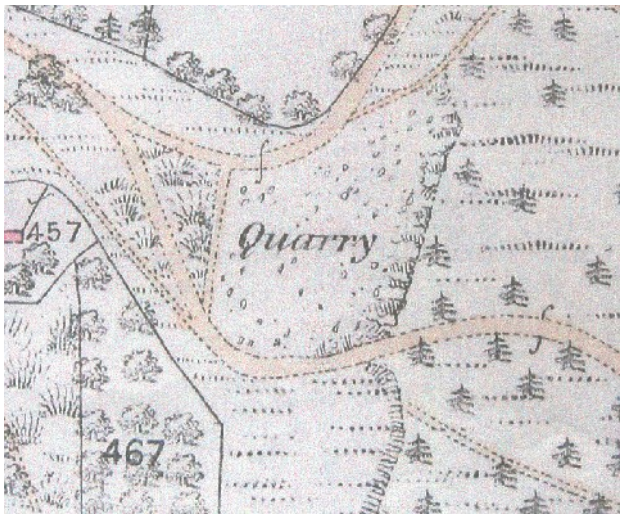
Hosey allotments or Kennedy Gardens as they were sometimes called were set out on common land in 1835 in the bottom of the same dry valley as the quarries .It can be seen from the 1867 25" OS map that the two halves of the allotments are divided by a causeway that ran towards Series 3. The two halves of the allotments are offset where they abut the causeway showing that the causeway already existed when the allotments were laid out. From the causeway one track leads to but swings to the left round the abandoned entrance to Series 3 and another track swings to the right towards another abandoned entrance. This clearly indicates that Series 3 was established by 1835 and may still have been in use. It was certainly out of use and no longer shown as a quarry when the map was made in 1867. There is a 'Gravel Pit' shown just to the north of the track but this was probably exploiting gravel from an old waste tip.

There is no track shown leading to Series 4 so either Series 4 had not been opened in 1867 or it was so long out of use that it was just not shown. The same can be said of Series 1 and 2.

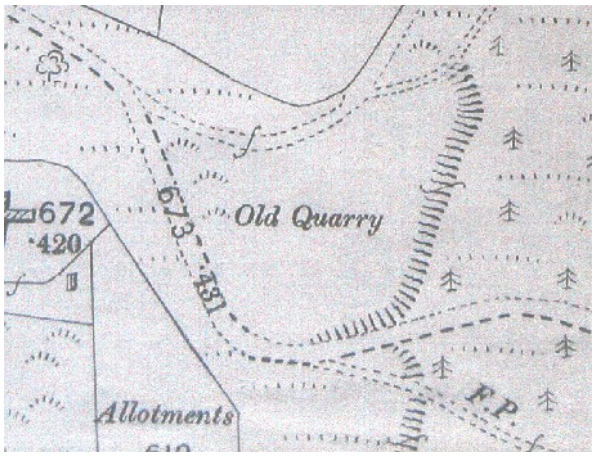
On the same 1867 map the area adjacent to Series 1a is called 'Quarry' and clearly shows a number of adits. The escarpment of the dry valley is shown very differently in this area compared to the rest of the escarpment, so it would seem that Series 1a was still in use in 1867. Thirty years later the OS map of 1897 does not mention the gravel pit near Series 3 nor is there any indication of adits at Series 1a, it is just called 'Old Quarry'.



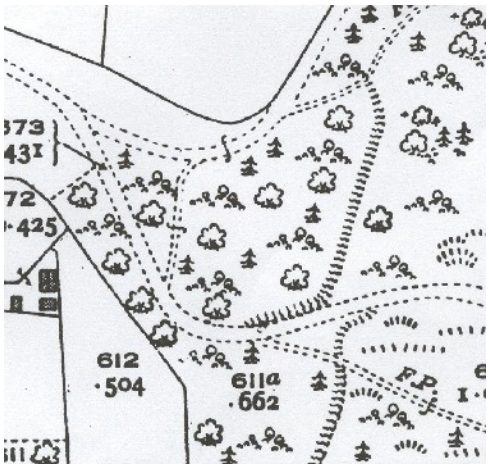
Offset boundaries to Hosey allotments 1867 with causeway between them



Adits in the Quarry at Series 1a 1867 (Note the treatment of the escarpment.)



Old Quarry at Series 1a 1897



The same area in 1930

By 1930 neither Quarry nor Gravel pit is mentioned.

EJ Stenning went to Hosey school in 1895 and writing in 1933 he describes digging out ‘the caves’ and exploring them by candlelight. So clearly by that time they were out of use. From my own experience I know that when I went to Hosey school in 1937 none of the southern adits (Series 5 & 6) were visible being completely filled in and covered with a dense cover of gorse, bracken and heather. The track across the causeway was just a very narrow path on the northern edge with several large trees growing on the causeway itself. Several adits into Series 2 and 3 were open but none of the adits in Series 1a were. The area in front of them was clear with just a growth of fairly young sycamores and a considerable amount of loose small rubble.

In a book titled ‘A handbook for travellers in Kent and Surrey’ by John Murray printed in 1858 he says ‘At Charts Edge (ie Hosey) on the range of sandstone hills south east of the town, some quarries have lately been opened a visit to which will prove interesting to the geologist.’

In Highways and Byways in Kent printed in 1914 Jerrold the author suggests that ‘a visit should be made to the rag stone quarries’ before going down into Westerham.

Donald Downs, an old Westerham inhabitant tells of a Mr Stone who died in 1936 aged 80 who had worked in the caves quarrying stone. Mr Stone would have been born in 1856 and could have been working from c 1870.

The last stone to be taken from the Hosey quarries was probably some time just before the first World War, this was for some work being carried out at a house called Charts Edge, Hosey and was reported by Dennis Anscombe another old Westerham man. Dr Buchan of the Geological Survey writing in 1956 argued a very strong case for the quarrymen using many short cut methods to extract stone with the least expenditure of effort towards the end of the active life of the quarries which would suggest that stone was only being taken occasionally on an ‘as needed’ basis.

Using all the evidence listed above I would argue as follows: The earliest stone was taken from open cast pits that have subsequently been buried under waste from the later underground workings. Series 5 and 6 are the earliest underground workings and may well be the source of the stone used in the construction of the Tower in Tower Wood (1731) only 670 yards away. These adits were completely unknown until rediscovered by KURG in 2003. From the evidence of the layout of the allotments we know that Series 3 was in existence and possibly in use in 1835 but by 1867 was only shown on the map as a 'Gravel Pit' while Series 1a was clearly shown as a 'Quarry' with adits. But by 1897 the 'Gravel Pit' near Series 3 was not shown and the adits at Series 1a had all disappeared from the map and it was just labelled 'Old Quarry'. By 1930 no quarries are shown at all. Although it is by no means conclusive it is perhaps significant that all evidence found underground is 19th century, the graffiti, the beer labels and the clay pipe.

Stone masons in Westerham using census data

It was thought that the census records might list those people working in the quarries.

A census has been held in England every ten years since 1801. Unfortunately the earliest census were little more than head counts and are not generally available for research but by 1841 much more information was collected and this is now readily available. Every census up to 1901 can be consulted and much useful data extracted. Although no quarry men were found in the census it has been possible to build up a picture of who the stonemasons were in Westerham between 1841 and 1901.

In the 1841 census there were seven stone masons in Westerham, six were men in their 20s and one aged 40 and all born 'Not in County'. They all lived in Crockham Hill. By 1851 the number had fallen to two masons both young men from the same family and whose father Thomas Horseman was a builder. The whole family came from Oxford. In 1861 the number had jumped to eight masons with only one, a stone sawyer, born in Westerham and five from Oxfordshire, three of them named Horseman. One Thomas Henderson aged 60 living at Crockham Hill was 'Born in Banbury' and was 'Stone mason employing six men'. 1871 saw the numbers fall again to five, all of them from the Horseman family, two of whom had been born in the parish and one George Horseman aged 43 described as 'Mason of the firm of Hord-- Oxford.' Sarah Horseman was also a mason and aged 66. She had lived in Crockham Hill since 1851. In 1881 there were just three left: Thomas Horseman, 52 born Oxford, George Horseman 53 born Oxford. Both these men lived in New Street. Still working was Sarah Horseman, 76 born Oxford and living in Crockham Hill..

In the last two census of 1891 and 1901, there were no masons living in Westerham but there were two members of the Bateman family who for many years dug gravel on Hosey Common. This family found a hoard of Belgic gold coins in a hollow stone in their gravel pit on Hosey in 1927 and as this find spot is given on the OS map of 1930, thus it is clear just where their gravel pit was, not near any of the earlier quarries. Finally a note found in a Squerryes estate accounts book of 1757 tells us that the Surveyor of Edenbridge paid 8 shillings for 16 loads of Chart (ie Hosey) Gravel.

From the evidence of the censuses it would seem that so little masonry work was carried out in Westerham before the Victorian building boom that there was no

tradition of stone working in the town and when the demand came experts had to be brought in from an area that did have a long tradition of building in stone. No doubt these experts would have employed local labourers, but of course these only show up in the census as 'Labourer' and there were plenty of those in Westerham in the19th c.

When the stone building boom ended all these expatriates went back to Oxford and their descendants names can be found in trade directories of the early 20th c still working in Oxford as masons.

Archives

In spite of spending a great deal of time in the Centre for Kentish Studies in Maidstone it has not proved possible to find any reference to the caves in any of the records of Westerham Manor or Squerryes Estate, but these records are very incomplete.

Bats

As mentioned above the caves are closed to casual visitors by locked gates and grills. This is to protect the various species of bats that hibernate there. Grills were fitted shortly after 1972 when the site became a 'Site of special scientific interest'. (SSSI) In 1981 further work was carried out to improve access for the bat population and more grills and locked entrances were installed in 1983, 1984 and 1987. As a result of all this work the bat population has steadily risen from a count of less than five in 1980 to over fifty by the nineties. (The author does not know the present bat count.) These counts do not represent the total bat population but only those seen on any counting visit. Due to their secretive hiding places this is only a fraction of the total. There are five different types of bats using the caves: Daubenton's, Natterer's, Whiskered, Brantd's and the Brown long eared. Apart from fairly large animals such as rabbits and foxes that may use the caves, there is also a rich insect fauna and a small underground flora.

Conclusions

From the foregoing it can be seen that stone has been used for building in Westerham for over 800 years but in all that time Westerham has never acquired a tradition of masonry work. A study of the buildings in Westerham shows that with the exception of the 19th c boom most buildings are of brick or timber. Of course old buildings will have been pulled down or remodelled but it seems unlikely that many of these would have been of stone. Hosey has certainly supplied building stone for a very long time, but I believe the bulk of the underground working was in the Victorian period.

R.C.Combley. Oxford 2010