KENT ARCHAEOLOGICAL SOCIETY

C. N. Kidd's Chalk Mine at Shepherds Lane, Dartford

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Charles Newman Kidd came to Dartford in 1868 when he acquired William Miskin's Brewery, having learnt the brewing trade at the Holmes and Styles Medway Brewery. He rapidly became a well-known brewer, businessman and civic dignitary. One of his business interests was brick making and he was listed as such in various local directories from around 1884 until 1903, although he is probably best remembered for his Steam Brewery in the town.

In the latter half of the 19th century, a large number of brickfields were in operation around the suburbs of London and north-west Kent, to supply the growing demand for building materials for the expansion of towns following the coming of the railways. These brickfields sprang up almost anywhere that a suitable clay or brickearth could be found in order to produce the distinctive yellow 'stock' bricks, which are such a part of our Victorian townscapes. The ingredients of the stock bricks produced by these works consisted of brickearth, finely crushed chalk and sifted ashes or breeze. The breeze was obtained from town refuse (an early example of re-cycling) which was added to the clay and chalk mix so that the raw, or 'green', bricks contained combustible material. A liquid slurry of the above ingredients was fed by wooden troughs or 'launders' into large settling ponds known as 'washbacks' or 'malm ponds'. Here the water would slowly drain off to leave a stiff homogeneous paste that could be hand moulded to size and then left as green bricks to dry further before burning in large open clamps. The addition of chalk to the mix reduced the tendency for the freshly moulded bricks to crack and shrink when drying. During firing the chalk formed a silicate of lime, which made for a very durable, yet cheaply produced product. The usual amount of chalk added was between 15 and 20%, below this figure the distinctive yellow colour was not achieved. The chalk was obtained as close as possible to the works, from a local quarry if it was practical and economic to do so.

It was much more common, however, to win the chalk from a mine sunk in the floor of the brickearth pit.

Kidd had two brickearth pits in Shepherds Lane, Dartford – one to the north of the road between the later developments of Somerset Road and Christchurch Road (TQ 5301 7395), and one to the south (TQ 5301 7389). A small service tunnel connected the two pits under the road, which at that time was little more than a cart track less than half its modern width. From a study of contemporary maps and plans it would appear that the actual brick making activity was carried out to the north of the road, the excavated brickearth from the southern pit being brought into the works via the shallow tunnel.

The chalk required for the process was obtained from a deep mine under the south-east portion of the northern pit. This portion of the pit also contained the chalk crushing mill and other plant for the mixing processes etc. The mine had been wisely sited well away from the row of washbacks that were at the northern boundary of the works. A great deal of water drained off these settling ponds into the ground below. If situated above the mine the constant ingress of water concentrated in one area could seriously weaken the roofs of the galleries and thus cause falls and subsidence. A chalk mine associated with a brickfield at Plumstead in south-east London (Cemetery Brickfield) suffered a disastrous collapse in 1904 that was so severe that the mine had to be abandoned and new shaft sunk to re-start extraction in a safer area.

When the Dartford mine ceased operation, probably around 1912, the brickearth pits were used as two rubbish tips for Kidd's brewery in the town. The shaft of the mine had not been permanently sealed at this time and was still accessible although probably fenced off for safety. In 1920, local council workmen entered the mine via the shaft and drove a small tunnel from the mine to intercept a well shaft that was near to some western galleries. A 15inch (380mm) diameter drain, which connected to the surface water sewers of Shepherds Lane, was let into the well shaft and thus the mine was converted into a giant soakaway for rain run-off from the local roads. The well top was capped with manhole access and the original entrance shaft capped with a concrete raft, also with a manhole, although the site of the latter then slowly disappeared under landfill. Around this time the local council was also utilising the brickfield site as a tip for road sweepings.

The brickearth had been excavated down to the junction with the chalk in parts of the pit, some 3 to 4m below the original ground level. The refuse from the brewery and road refuse filled the southern half of the pit to almost its original level. The fill consisted of boiler ash and clinker, bottles and various miscellaneous rubbish. It is possible that some tipping had commenced even before the works had finally ceased, as the quarrying operations for brickearth were concentrated in the western portion of the pit towards the end of its life.
The site of the old brickworks remained more or less unused for several decades. In World War 2, an air-raid shelter was built in the south-east corner near to the road and at some time later a scout hut and an electricity sub-station were also constructed.

In 1980, Kent County Council, who owned the site at the time, wished to sell off the land for housing development. [Plate 1] Before this could happen, it was necessary to gain entry to the mine to check the accuracy of a plan of the workings made around 1920 by the local authority. This somewhat stylised drawing showed the general layout of the galleries and the approximate positions of the well shaft and main haulage shaft. [Fig 1] By the 1980s, all trace of the former brick making industry had disappeared and a mechanical excavator was used to remove some of the landfill in an attempt to re-expose the main shaft. This was unsuccessful, although the remains of the chalk-crushing mill were found together with the top of the well. The well shaft had been capped with a re-enforced concrete slab supported by steel girders with a hinged metal manhole set in the centre to controlled access.

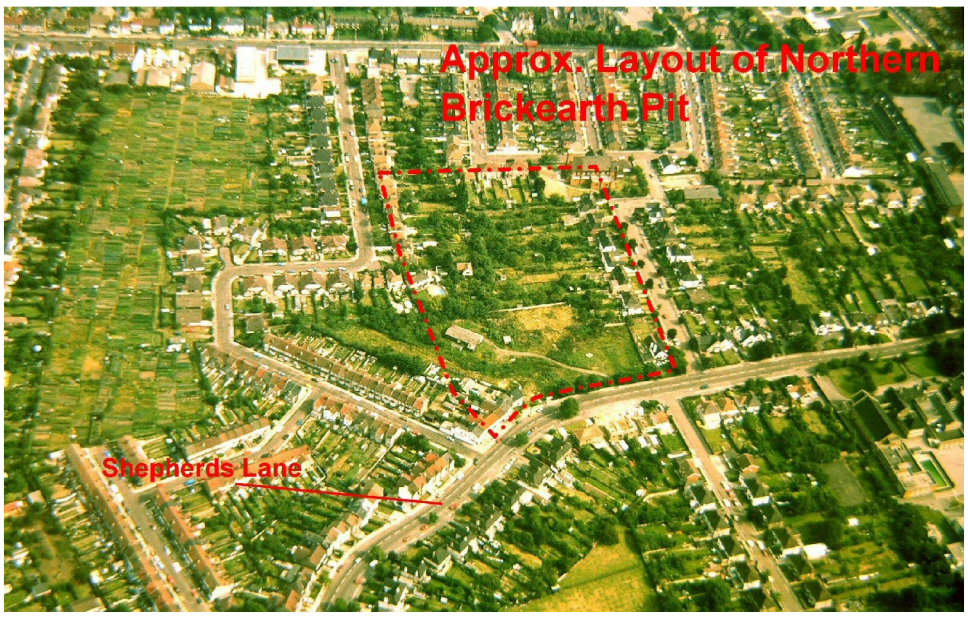


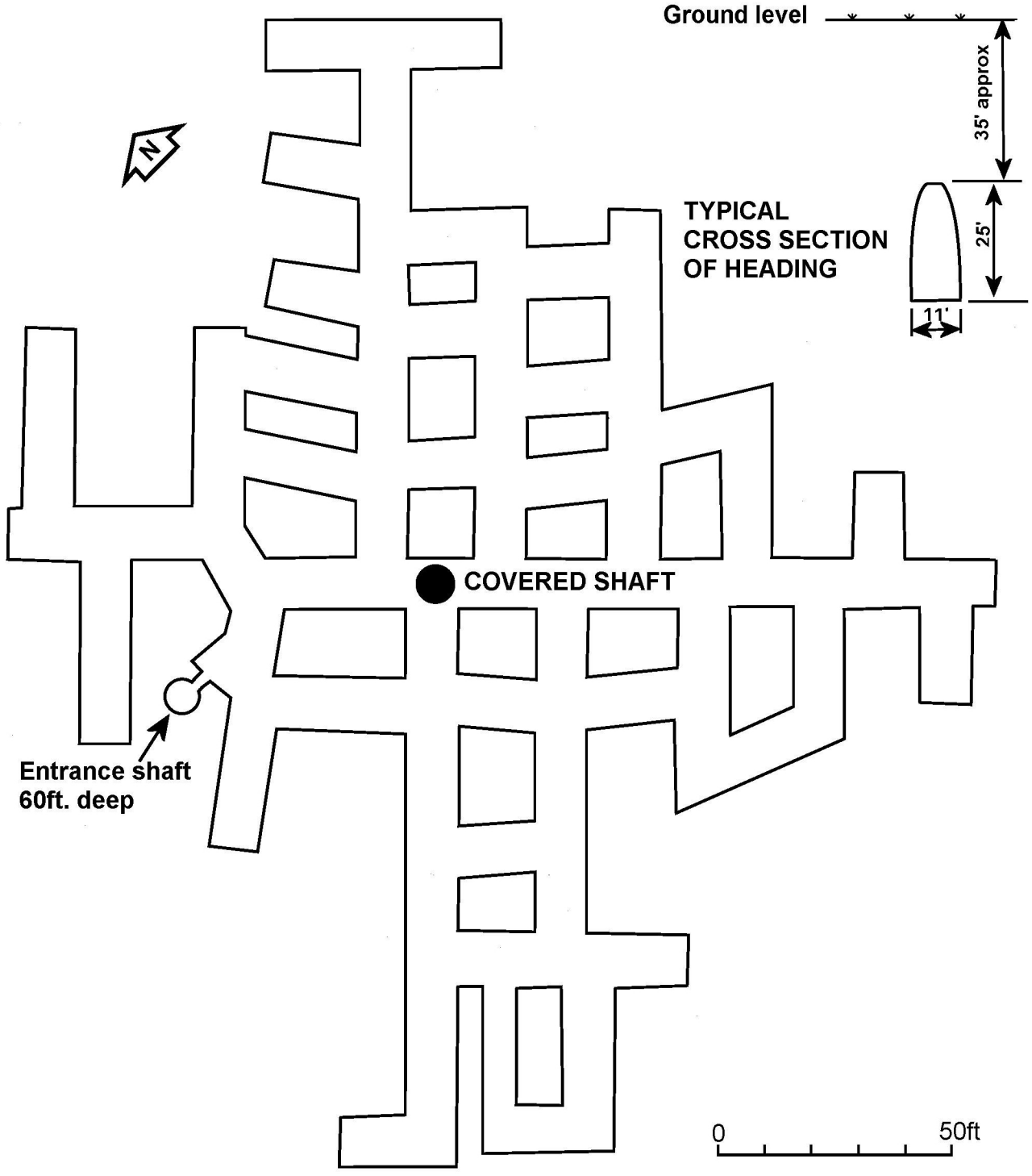
Plate 1 Aerial Photograph of the Site

Entry to the underground workings was gained on 12th December 1980. On that date H. Pearman and T. Reeve of the Chelsea Speleological Society together with the writer representing the Kent Archaeological Society and a Mr Coe of Golder Associates (the consulting Engineers for the KCC), descended the well shaft by means of wire ‘caving’ ladders and entered the mine via the soakaway tunnel. A quick survey of the underground galleries was undertaken at the time to compare with the earlier plan. The 1920s plan was found to be flawed, especially with the depiction of the south-western galleries.

The access well shaft was found to be 23m deep, 2m wide and brick lined for the top 5m where the shaft passed through Thanet Sand. The rest of the shaft was unlined through Chalk. The remains of wooden cross beams were found in the shaft, which would have originally supported the water pipes, used to draw water up to the surface for use in the brick making process. The active 15inch (380mm) drain entered the shaft 2m below the surface with another disused pipe of similar size at the same level. An examination of the tool marks in the access tunnel confirmed that it had been dug from the mine to intercept the well shaft. This small tunnel, 1.6m high, is in sharp contrast to the high galleries of the mine.

CHALK MINE

SHEPHERDS LANE, DARTFORD



The mine was found to be in very good condition, mainly due to the care with which the miners had executed their work. The chalk tunnels were dug on a ‘Pillar and Stall’ mining principle in which galleries were dug at right angles to each other thus leaving large square pillars of chalk to support the ground above.

Plate 2 Typical Gllery (Photo: H. Pearman

The shape of a chalk mine tunnel was very important to the stability of the roof and the Dartford miners had cut the galleries to a safe arched profile. [Plate 2] The galleries were, on average, 3m wide at the base reducing to 0.5 to 1.0m wide at roof level, which varied between 7 and 10m above the floor. Additional stability was gained by ‘off-setting’ the pillars so that the cross passages did not cross straight over the main tunnels but were staggered to lessen the risk of roof weakness at the junction of four tunnels.

The method of working the mine was quite unusual for this type of excavation. Instead of proceeding forward in a series of steps or benches about 1 to 1.5m high by 1 to 2m deep, the Dartford miners cut steps only a few centimetres high and less than 1m deep in most of the galleries. As the chalk was cut out and tumbled down to the floor, the steps broke up leaving a steep slippery climb to the working face. This must have made working conditions both difficult and dangerous for the workmen.

Deep grooves were found at the base of the original shaft that had been formed as the heavy loads swung back and forth on the hauling rope as they were pulled up to the surface some 25m above. [Plate 3] Iron supports for a fixed ladder were still in-situ although the ladder had been removed when the mine ceased operation.

Plate 3 Main Shaft with ladder supports

Approximately 400m of passages had been excavated during the mine's active life and a rough calculation gives a conservative estimate of around 6000 tonnes of chalk extracted.
In some larger chalk mines, such as those at the Wickham Lane Brickfield in Plumstead, the chalk was transported from the work faces to the haulage shaft by means of small hand propelled trucks running on narrow gauge rails or plate-ways. A small mine such as Kidd's, however, rarely employed more than three or four men underground at any one time and it was not considered worth the expense of installing any such underground transport system. It was more economic to take the chalk to the shaft bottom in barrows.
In the floor of one gallery to the south of the shaft was a deep fissure in the floor into which much of the flood water drained.

An interesting feature found just off a main gallery near the shaft was a small room cut inside a pillar and entered by a flight of four steps. A low narrow bench or seat cut in the chalk ran around the sides of this small room, which was probably used to store tools and where the men could take meal breaks. [Plate 4] This is shown on the plan as 'manager's room'. At this period, a manager of a chalk mine was not an executive or

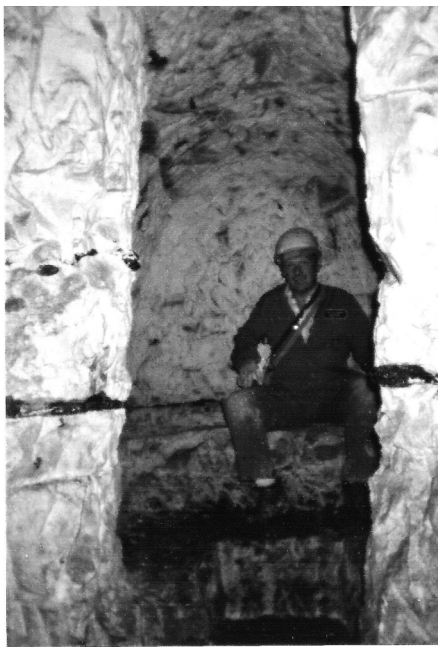


Plate 4 Small Room with Bench Seat
Photo: H. Botterman

administrator but more a skilled charge-hand or foreman. He would closely supervise the cutting of the roof profiles and the arching of the pillars where galleries joined.

Some other pillars near the shaft showed similar signs of ‘pillar robbing’ where miners would cut small tunnels though pillars to get a little extra chalk without having to go all the way to a remote working face. This usually occurred toward the end of the mine’s life when long term stability issues were regarded as minor considerations.
Near the base of the shaft were found a number of ‘tally boards’ scored in the walls of main galleries. [Plate 5] These were used by the miners to record the number of loads that had been taken out of particular areas of the mine. As a miner was usually paid on the number of loads it was in his interest to keep a record of loads sent up to the surface.
At the base of the shaft were a number of carefully cut inscriptions “COME UNTO ME ALL YE THAT LABOUR” and “GOD IS LOVE”, [Plates 6 and 7] also the owners name “C N KIDD DARTFORD”

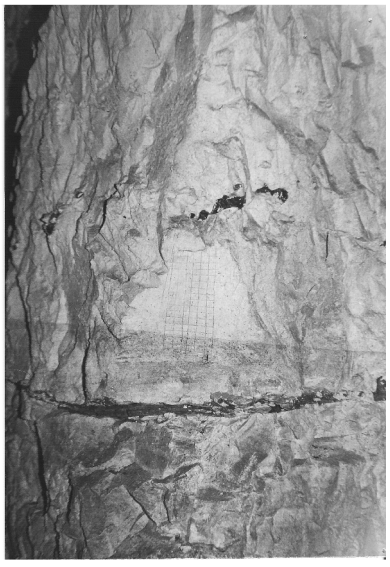


Plate 5 'Tally' Boards

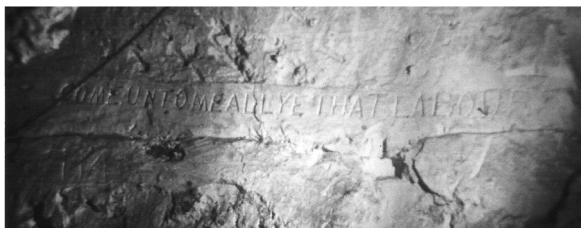


Plate 6 Base of Shaft Inscription

Plate 7 Base of Shaft Inscription

At one point in the workings, a miner's progress along a side gallery could be traced from the patches of soot left on the roof from his candle. As he advanced the face a metre or so, he moved his light source to create another soot mark. At the end of the tunnel the metal candleholder was found still in its last position jammed in the wall, with a neat row of black marks leading back to the main gallery.

At the end of some tunnels, miners had smoked their initials in the roof. [Plate 8] In other places, they neatly carved their names on the walls. The mine was active from the mid 1880s to 1912 although the main bulk of dates found were between 1901 and 1911. One later inscription, "A E J PRICE 28.11.31", was probably made by a Council official inspecting the soakaway.

One name of interest that was found cut into the wall of a cross-gallery was that of R. Faulker. [Plate 9] He was the 'Engine man' of the mine and was responsible for operating the hauling mechanism and maintaining the winding engine. In March 1900, he assisted the local antiquarians Ralph and Ernest Youens to descend and record a three chambered mediaeval denehole that had opened up in the worked out southern brickearth pit. Details were published in 'Man' May 1928 and reprinted in the West Kent Advertiser 18.5.1928.

Plate 8 Smoked Initials on Roof

Plate 9 'Rubbing' of Faulker Inscription

Plate 10 Remedial Works
Photo: H. Botterman

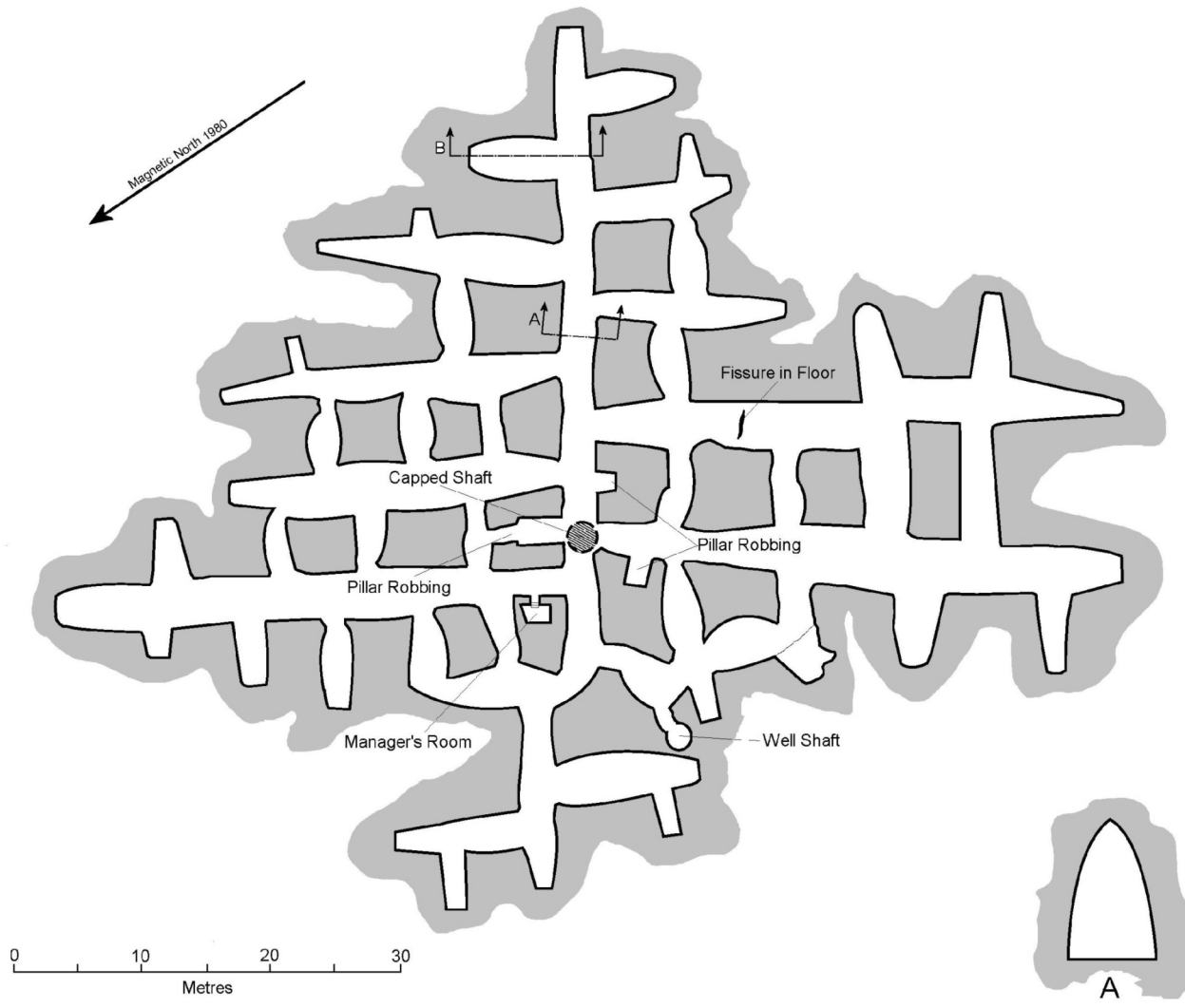
After the 1980 examination of the chalk mine the land was finally sold off for building development. In 1986 the mine was re-entered by contractors who conducted an instrument survey of the chalk caves and undertook some remedial works to comply with safety recommendations. These measures took the form of spraying the roof in some parts with concrete to prevent small flakes of chalk falling [Plate 10] and modifications to the drain and well shaft. The Kent Underground Research Group assisted the contractors by undertaking a photographic survey on their behalf. At the same time the Group’s surveyors completed their own survey, building on the measurements taken in 1980. [Fig 2]

Once the remedial works were completed, a small housing estate, Sullivan Close, was built on the site. Today there is nothing to enlighten the modern visitor to this quiet cul-de-sac of the once busy industrial site beneath their feet.

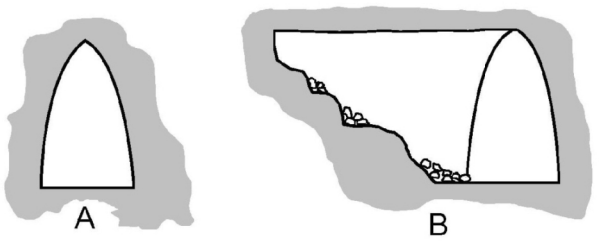
CHALK MINE

Shepherd's Lane, Dartford

Kent Underground Research Group
Surveyed 1980 / 1986



Sections



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