

SUPPLEMENTARY DATA FOR 'QUARRYING CHERT AT BAKEWELL' IN MINING HISTORY 19.6 (Spring 2017)

The information given here comprises two appendices originally intended for Mining History and also the detailed archive catalogue and, as an aid to cross-referencing, a list of passage name changes. With the archive catalogue, it should be noted that these were compiled well before the publication text, started as survey was being undertaken, and specific aspects of interpretation were changed as analysis during report preparation proceeded; no attempt to update the original archive texts has been undertaken.

A spread sheet and plans with passage and artefact numbers, survey drawings and artefact plots are also accessible on the website, added as separate files.

Appendix 1: Pretoria Mine - Passage Descriptions John Barnatt: 2014-15

The Inclines

Passage 1: Main Incline

This was the first and main incline in the New Mine and, given what we know of the development of the mine to 1922, was created from this date and gradually extended into the 1930s. It came to surface in the open quarry, which has been subsequently backfilled. A concrete pipe, was placed vertically at the time of backfilling so that access to the underground workings was maintained. Beyond a short first section with artificial roof and mortared walls, the passage runs down with un-mined walls to either side to the first junction. There is what was probably a small transformer room to one side, and beyond was a wooden door across the incline. At the first junction what started as a face passage but later was used as the short Incline 5 leads off in one direction, while opposite is another door that led back to the open quarry. Here, at a point latterly open to daylight, there was previously a now-removed shaft to surface. Beyond was a route to the Old Mine and Inclines 3 and 4.

Below, Incline 1 passes between pack walls on either side, with passages leading off in both directions. At the second junction the later Incline 2 leads off southwards. At the original bottom of Incline 1 the passage has fallen in where it entered the major collapse zone in this part of the workings. Presumably shortly after the collapse occurred, which was probably in c. 1938-39, the passage was diverted to one side, following a curving course to access the South-Eastern Working Face; there is no evidence that the tramway ran here. Throughout the incline there are butt joints at relatively long to moderate intervals, showing progressive building phases heading down dip. The majority of the packs were completed, except for two short stretches. In the lower half some pack faces have collapsed and the fallen deads cleared away, showing the passage was still in use at the time this happened.

The present passage height is c. 3.2-1.5m at a centre line. However, the floor of Incline 1 has been partially infilled, with a tramway laid on top of the backfill. In the upper part this has iron sleepers, with a junction at Passage 5 with points, then the extant Jubilee line turns at points into Incline 2. Lower down the tramway has been removed but there is a now isolated turntable and the sleepers were of timber, probably indicating these were part of the original 1920s/30s tramway, which was replaced in the 1940s.

Specific features in this passage include the false roof next to the entrance; two mine doors that prevented access at the two openings from the open quarry; a probable transformer room with timber framed wall; electrical insulators, isolator box and heavy-duty cable; Jubilee rail, points, wire rope rollers, with oiling equipment, and a fender at the wall at two curves, wooden tramway sleepers and sleeper slots for these and a tramway turntable; plug and feather holes in pack walls, timber roof supports; alcoves; a compressed air pipe and valve; an anchor point, and an anchor plate; roof lifting pins, one with a pulley, sites of other lifting pins and roof holes for lifting pins or wooden plugs; roof fittings for electric lighting cables; wire rope impressions and wear grooves; a roof staple, and a small roof pin; wall pins, a wall hook, and hanging pins and loops; a wall inscription; and a small toilet area. There are also drill steel testing holes in one section of face wall and in the roof there is a borehole drilled from surface.

Discarded or stored items include a feather from plug and feathers, pulleys, wire rope rollers, an iron tramway sleeper, possible anchors, wire rope, fishplates and a fishplate bolt, a shovelling plate, a drill steel and bit, a drill steel extractor, compressed air pipe, a compressed air hose, an electrical isolator, fuses, light fittings, electrical lighting cable, timbers, hook and chains, a dog clutch, a pickaxe head, cigarette packets, newspaper, an iron strap, a roof staple, a brazier, a carved wooden pin, metal tins, and a glass bottle.

Passage 2: Southern Incline

This was the second incline in the New Mine, started in about 1940 after a major collapse in the bottom area off Incline 1. The major roof-fall prompted a change in where stone was extracted, making a new incline desirable to avoid the unstable area and to cut down transport distances from the new working area. It left Incline 1 relatively near its top and this was used to complete the journey to surface when stone from the new working area was being hauled up. From the top of Incline 2 going down, it mostly passes between pack walls on either side, with passages leading off in both directions. However, in the top part there is an unworked face on the updip side in one place, with support pillars and packs to rationalise the passage side, all in an area where the incline was taken down a pre-existing face passage when its function was first redefined. Below, in an area where the workings were being extended down dip in the first half of the 1940s, with the incline following on, there are pack walls on both sides. In the bottom part the incline, driven in 1947-48, it only has cross passages to one side, while to the other side is an unworked face.

Throughout the incline there are butt joints at relatively long intervals, in parts with relative chronology not apparent, but in other areas showing progressive building phases heading down dip. The majority of the packs were completed, except three short stretches. Near the top of the incline a stretch of the down dip pack wall face has collapsed and the debris has been removed at a time when the passage was still in use.

The present passage height is *c.* 3.4-2.0m at the centre line. However, the floor of Incline 2 has been partially infilled, with a Jubilee tramway with iron sleepers laid on top of the backfill. At the top the incline tramway leaves that in Incline 1 at a set of points. At three out of five cross passage junctions down Incline 2 there are tramway turntables. Why one of the upper junctions has no turntable is unclear, while the curve at the bottom of the incline leads into the bottom cross passage, suggesting that there was no plan to follow the beds further down dip.

Specific features in this passage include Jubilee rail, tramway turntables, wire rope rollers, and wire rope wear grooves; an alcove; timber roof supports and concrete-block pillars; a compressed air pipe and valve; anchor points, roof lifting pins and sites of others, and roof holes for lifting pins or wooden plugs; roof fittings for electrical cables; a small roof pin, hanging pins and loops; and a wall inscription. There are also drill steel testing holes in the face wall at the lower end.

Discarded or stored items include slow fuse, a detonator box, gelignite wrappings, wire rope roller parts, wire rope, S-hooks and canvas straps, dog nails, drill bits, Victaulic couplings gasket, light bulbs and fittings, electrical lighting cable and fittings, a carbide lamp, carbide dumps, cigarette packets, a matchbox, newspaper, a metal plate, an oil tin, a paraffin heater gauze, a kettle lid, a plastic bucket, and a glass bottle.

Passage 3: South-Eastern Incline

Incline 3 and Incline 4 are in the Old Mine and were created over the first two decades of the 20th century as the beds were followed down dip and eastwards, following an initial period of extraction up dip of Cross Passage 11. The first of the two created was Incline 3, probably from *c.* 1905, followed by Incline 4 from sometime around *c.* 1912 as a second down dip block of chert was extracted that lay north-east of the first. At their tops the two inclines join together at a chamber with a doorway where daylight was reached at the open quarry face. Before this quarry was dug, the passage continued a short distance to a now-removed shaft to surface sunk in 1900, with a short horizontal link continuing beyond from the shaft base, probably created much later when the old mine had trial reworking in the 1950s, and leading to Incline 1 in the New Mine.

Throughout the incline there are butt joints at short intervals, mostly showing progressive building phases heading down dip. However, in the top part there are also infilled passages between what appear to have been freestanding packs. The present passage height, where not later backfilled, is *c.* 3.4-3.5m at the centre line. In this down dip section the floor of Incline 3 had been partially infilled, with a tramway with wooden sleepers laid on top of the backfill. However, when disused, part of the passage was backfilled from the top end, with the upper half backfilled leaving only a crawling to stooping height access way.

Specific features in this passage include slots for wooden tramway sleepers; alcoves, timber roof supports; a displaced crab winch and platform; roof lifting pins, and sites of others, roof holes for lifting pins or wooden plugs, and small roof eyes. Discarded or stored items include a boot iron, a shovel blade and a grease tin, and there is carbide lamp sooting.

Passage 4: Eastern Incline

Incline 4 was created sometime around c. 1912 as a second downdip block of chert was extracted that lay north-east of the first; its line probably roughly reflecting the pre-existing face passage created in conjunction with working using the earlier Incline 3. However, the very bottom of Incline 4 is an extension created in 1953-54 when trial reworking of the face below was undertaken. At their tops the two inclines join together at a chamber with a doorway where daylight was reached at the open quarry face. Before this quarry was dug, the passage continued as short distance from a now-removed shaft to surface.

Throughout the incline there are butt joints at short intervals, all showing progressive building phases heading downdip. The present passage height is mostly c. 2.6-3.0m at the centre line, except at the bottom where it is up to c. 4.0m. The floor of Incline 4 had been partially infilled, with a tramway with wooden sleepers laid on top of the backfill. This presumably was first used in the 1910s and was later resurrected, because it provided the extraction route for trials at the face in 1953-54.

Specific features in this passage include the door at the entrance from the quarry; slots for wooden sleepers and tub wear; alcoves; timber roof supports; a winch platform and fittings; roof lifting pins and sites of others, roof holes for lifting pins or wooden plugs, and small roof pins; hanging pins and hanging loops.

Discarded or stored items include slow fuse, anchors, wire rope, wire rope clamps, bell cranks, a waggon wheel, drill bits, compressed air hose with fittings and Hercules clips, an electrical fuse, a light bulb and fittings, oil drums, a carbide drum, timbers, a crowbar, cigarette packets, iron beams, an iron lever, iron wedges, a crab winch handle, a clay deposit, grease tins, an oil tin, a brush head, a tin of Zubes lozenges, brass furniture handles, a filter from a tundish funnel, a paint tin, a tin can, a toasting fork, a coat hanger, a plastic knob and glass bottles.

The Cross Passages

Passage 5: Western Incline and First Southern Cross Passage

This passage comes from Incline 1. The first part started life as a face passage created in the first half of the 1950s, beyond which it turns and was gradually lengthened as the face was worked between 1959 and 1964. In the first section, which follows the dip of the bedding, there is finished pack to the downdip side and an unworked face updip. Beyond there are walled packs to both sides, with butt joints at relatively long intervals, with one at the end not completed that was being built as a working area at the time the workings ceased (Passage 19). The present passage height is c. 2.5-5.0m at the centre line, with this increasing away from the incline. The floor has been partially infilled, with an inclined tramway with iron sleepers laid on top of the backfill in around 1960.

Specific features in this passage include in-situ Jubilee rail, tramway stops, and wire rope rollers on the passage wall at the bend; timber roof supports; an in-situ compressed air pipe; winch platforms and anchor points; roof lifting pins with one with a pulley; a hanging pin; and a storage area.

Discarded or stored items include slow fuse, detonator wire, detonator box, plugs and feathers, a shackle pin, wire rope, hooks, choke chains, pulleys, shovelling plates, a mine ladder, a fishplate, scaffold poles and clamps, drill bits and drill steels, spare compressed air pipe, compressed air hose with fittings, light bulbs and fittings, electrical cable, an electrical fuse box, a greenstone grindstone, oil drums, iron wedges, spanners, a saw, a roofing bar, a funnel, an oil tin, and a metal tin.

Passage 6: Second Southern Cross Passage

The earliest half of this cross passage comes from Incline 1 and probably dates to the 1920s-30s. After crossing Incline 2 there is a section extended later that was gradually lengthened as the face was worked between 1937 and 1944. There are walled packs for the whole distance, with pack butt joints at relatively long intervals throughout, mostly showing progressive building phases heading towards the face. However, on the downdip side of the earlier half there were also 'freestanding' packs with infilling between, not all of which have been completed, presumably because of lack of deads. Where finished, the packs are usually still intact, except for two very small areas of collapse in the new half, one of which has been cleared away showing the passage was

still in use at the time of clearance. The present passage height is *c.* 2.2-3.5m at the centre line. The floor has been partially infilled, with a tramway with wooden sleepers laid on top of the backfill.

Specific features in this passage include wooden tramway sleepers and sleeper slots for wooden sleepers; plug and feather holes in pack walls; timber roof supports; a compressed air pipe and valve; a winch platform and anchor points; roof lifting pins and sites of others; roof fittings for electrical cable; roof holes for lifting pins or wooden plugs; wire rope wear grooves; a small roof pin, roof hooks and hangers, a wall pin, hanging pins and loops; a small shelf; a wall inscription; and toilet areas.

Discarded or stored items include a detonator box, detonator wire, gelignite wrappings, feathers from plug and feathers, a fishplate, wire rope, a drill steel retaining clip, compressed air hose and fitting, light bulbs, packaging and fittings, electrical cable, corrugated sheets, an oil drum, chain, an iron bar, timbers, cigarette packets, rotted carpet, a matchbox, newspaper, a cardboard box, a crowbar, iron bars, a hacksaw blade, an oil tin, a metal tin, and glass bottles.

Passage 7: Third Southern Cross Passage

The earliest half of this cross passage comes from Incline 1 and probably most or all dates to the 1930s rather than any earlier. After crossing Incline 2 there is a section extended later that was gradually lengthened as the face was worked between 1937 and 1944, with walled packs for the whole distance. There are pack butt joints at relatively long intervals throughout, mostly showing progressive building phases heading towards the face, but on the downdip side of the earlier half there were also 'freestanding' packs with infilling between. Only two packs have not been completed, one in either half of the passage. Where finished, the packs are often still intact, but over the older half there has also been significant collapse, presumably because of atypical weight coming on. This first happened during the life of the mine, presumably either when the passage was still in use, or later because of worries of a catastrophic collapse destabilising the inclines. Pack supports were added and collapsed deads cleared from the floor. The present passage height is *c.* 2.0-3.1m at the centre line, and the floor has been partially infilled, with a tramway with wooden sleepers laid on top of the backfill.

Specific features in this passage include a tramway bed, sleeper slots for wooden sleepers, tramway stops, and a floor timber; plug and feather holes in a pack; timber pack and roof supports; winch platforms; roof lifting pins and sites of others, and roof holes for lifting pins or wooden plugs; plugs of roof electrical fittings; wire rope wear grooves; a small roof pin, roof hooks and hanging loops; hanging pins; a wall inscription; and toilet areas.

Discarded or stored items include slow fuse, gelignite wrappings, wire rope, drill bits, a drill steel retaining clip, Victaulic couplings, a Hercules clips, a tin of pipe-thread compound, light bulbs and packaging, electrical cable, cinders, carbide lamp sooting, a corrugated sheet, sacking, cigarette packets, newspaper, plain paper, a shovel blade, allen keys, an iron file, an iron bar, an iron pipe, a pen knife, a machine part, a Brasso tin, metal tins, and glass bottles.

Passage 8: Fourth Southern Cross Passage

This cross passage comes from Incline 2 with one short stretch going west to the nearby 1942-43 face and in the opposite direction leading much further; this part was gradually lengthened as the face was worked between 1942 and 1952, with walled packs for much of the distance. The exception is at the face end where there is a small 'pillar' of bedrock with a remaining vestige of a small topcut. There are pack butt joints at relatively long intervals throughout, but mostly not showing progressive building phases heading towards the face, but instead there are a series of 'freestanding' packs with infilling between, not all of which have been completed, presumably because of lack of deads, particularly near the face end. A long section of the updip pack wall has no recognised butt joints. Where finished, the packs are usually still intact, except for three small areas of collapse, two of which have been cleared away showing the passage was still in use at the time this happened. The present passage height is *c.* 2.3-3.4m at the centre line, with this increasing away from the incline. The floor has been partially infilled, with a Jubilee tramway with iron sleepers laid on top of the backfill.

Specific features in this passage include slots for iron tramway sleepers and a tramway bed; plug and feather holes in a pack; a timber roof support with graffiti; a wall inscription; anchor points; roof lifting pins, one with a pulley, and sites of others; roof pins for electrical cable; wire rope wear grooves; hanging pins and a plug; and the site of a compressed air pipe. There are also drill steel testing holes in the pack wall and a small area of rock floor.

Discarded or stored items include slow fuse, detonator wire, detonator box, feathers from plug and feathers, a shim, a shackle pin, wire rope, iron wedges and a bolt, a chain, a shovelling plate, a corrugated sheet, a cold

chisel, a drill bit, drill bit caps and boxes, a drill steel extractor, compressed air hose with Hercules clips, light bulbs, packaging and fittings, loose roof fittings for electrical cable, electrical cable, iron wire, a carbide drum and brazier, a carbide dump, greenstone grindstones and dressing wheel, timbers, canvas, sacking, cigarette packets, a tobacco pipe bowl, a matchbox, newspaper, a metal label, a leather glove, a shoe and boots, metal tins, a bucket, a metal kettle, a cooking pan, and a straw rim.

Passage 9: Fifth Southern Cross Passage

This cross passage comes from Incline 2 and was gradually lengthened as the face was worked between 1948 and 1957, with walled packs for the whole distance except at part of the downdip side where the face over much of the far half was never worked. There are pack butt joints at relatively long intervals throughout, mostly showing progressive building phases heading towards the face, but in one place on the updip side a 'freestanding' pack has been butted against from both directions. Small parts of the passage side packs have not been completed, presumably because of the lack of deads. Where finished, the packs are usually still intact, except for small areas of collapse, one of which has been cleared away showing the passage was still in use at the time this happened. The present passage height is c. 2.5-4.6m at the centre line, with this increasing away from the incline to a central high point, and reducing again to 3.5m at the far end. The floor has been partially infilled, by over 1.4m at one exposed part, with a Jubilee tramway with iron sleepers laid on top of the backfill. A particularly broad area of passage half way along may in effect be an alcove for a winch, created in association with the passage going off on the opposite, downdip, side.

Specific features in this passage include Jubilee rail on a levelled/revetted bed; plug and feather holes in a slab; timber pack/roof supports; winch platforms and anchor points; roof lifting pins, two with pulleys, and the site of another, and roof holes for lifting pins or wooden plugs; wire rope wear grooves; hanging pins; and a small shelf. There are also drill steel testing holes in the face walls.

Discarded or stored items include slow fuse, electrical detonators, gelignite wrappings, feathers from plug and feathers, a shackle pin, wire rope, a hook, a wire rope clamp, fishplate bolts, dog nails, scaffold clamps, drill bits, a drill steel rest, a water needle from a compressed air drill, compressed air hose with fittings and Hercules clips, machinery packaging, hose pipe, oil staining, two gas mask filters, light bulbs, packaging and fittings, electrical cable, copper wire, conveyor belting, carbide dumps, corrugated sheets, an oil drum, timbers, cigarette packets, newspaper, metal labels, an iron wedge, iron nuts and bolt, a boot and a boot iron, metal tins, an oil drum, a brazier, a broken tea cup or mug, a hacksaw blade, sledge hammer handle, and glass bottles.

Passage 10: Sixth Southern Cross Passage

This cross passage comes from the bottom of Incline 2 which curves through ninety degrees to become passage 10, suggesting there was no intention of taking the incline deeper. The cross-passage was gradually lengthened eastwards as the face was worked between 1948 and 1958. There are walled packs for the whole distance except on the downdip side where the face in the part nearest the incline was never worked. There are pack butt joints at relatively long intervals throughout, mostly showing progressive building phases heading towards the face, except in one place where a passage leading off appears to have been filled. There is only one pack which is unfinished, at the bottom of the incline, presumably because of the lack of deads. Where finished, the packs are still intact. The present passage height is c. 3.2-3.8m at the centre line, with this increasing away from the incline. The floor has been partially infilled, with a Jubilee tramway with iron sleepers laid on top of the backfill.

Specific features in this passage include Jubilee rail but also a wooden tramway sleeper; an alcove and an anchor point; plug and feather holes in pack walls; roof lifting pins and sites of others, roof holes for lifting pins or wooden plugs, and a small roof pin; and hanging pins along one side. There are also drill steel testing holes in the 1940s face and a drill steel sharpening area.

Discarded or stored items include detonator wire, a feather from plug and feathers, a bow shackle, a tub bucket, a scaffold pole and clamp, drill bits, an air lance, an air seal for an air leg, a compressed air claw fitting, compressed air hose and Hercules clip, a light bulbs and fitting, electrical cable, an electrical isolator box, greenstone grindstones, a corrugated sheet, timbers, cloth and a rag, cigarette packets, newspaper, an iron wedge, leather and plastic coated gloves, a plastic coat, a grease tin, an oil tin, a paintbrush, a piece of drive belt, a tea cup, an iron nut and bolt, and glass bottles.

Passage 11: First Northern Cross Passage

This cross passage passes the top of Inclines 3 and 4 and runs to the face, with walled packs for the whole distance. Although, for descriptive purposes, the flat upper end of the Incline is described under Incline 4, which

was created at the same time as Passage 11, it is clear from the 1917 assessment of the mine, that the quarrymen saw the flat area as part of Passage 11, with the whole termed the '*Main Level*'. It was created from 1900 and became redundant when extraction ceased immediately down dip of here in c. 1915, except for later use for waste disposal. There are pack butt joints at short intervals throughout, mostly showing progressive building phases heading towards the face. There is one exception towards the face end on the downslope side, where a 'passage' or 'working area' going off has been backfilled. The western half of the level was created in c. 1900-05 and was extended eastwards in c. 1912-15 after Incline 4 was created and a new block of chert worked to the north-east of that worked from Incline 3. The present passage height of Cross Passage 11 is c. 2.3-2.6m at the centre line near the incline end, dropping to under 2.0m as the face is approached; this contrasts with the eastern end where there is a chamber that is up to 4.8m high. The floor has been partially infilled throughout, with a tramway with wooden sleepers laid on top of the backfill. Part-way along there is a sudden drop down in the floor level of about 0.30-0.35m as if a new but incomplete phase of infilling exists that was being added from the incline end; slots for tramway sleepers are found to either side of this, with the sleepers presumably laid at different times. At one point a hole at the passage side confirms a depth of fill of at least 0.9m. The pack walls are usually fully finished, but on the upslope side near the end there were passages/working areas leading off to the nearby face that have not quite been fully backfilled. On the other side there are two small pack corners which are not quite finished.

Specific features in this passage include wooden tramway sleepers and sleeper slots for these; sites of roof lifting pins and roof holes for lifting pins or wooden plugs; and hanging pins on both sides. Near the face end there is a timber roof support and nearby a floor anchor point.

Discarded or stored items include shovelling plates, tramway sleepers, a fishplate and fishplate bolts, an iron ring, a piece of tramway rail, shotfiring wire, and a piece of corrugated 'iron' sheet.

Passage 12: Second Northern Cross Passage

This cross passage comes from Incline 4 for a relatively short distance to the face, with walled packs for the whole distance. It was created in c. 1912-15 when a new block of chert was extracted using Incline 4. There are pack butt joints at short intervals throughout, mostly showing progressive building phases heading towards the face. There is one exception to either side, both quite close to the incline end, where 'passages' going off have been filled. The present passage height is c. 3.2-3.4m at the centre line and the floor has been partially infilled, with a tramway with wooden sleepers laid on top of the backfill. The pack walls are usually fully finished; there is one small area of collapse and subsequent clearance near the face end.

Specific features in this passage include wooden tramway sleepers and sleeper slots for these; roof lifting pins and sites of others, and roof holes for lifting pins or wooden plugs; hanging pins along one side; and a tramway rail wedged across the passage above head height at the face end. Discarded or stored items include pieces of tramway rail, a shovel blade, pieces of compressed air hose with fittings, chains and glass bottles.

Passage 13: Third Northern Cross Passage

This cross passage comes from Incline 4 for a short distance to the face, with walled packs for the whole distance. It, and the very bottom part of the incline, were created in 1953-54 when trial reworking of the face below was undertaken. There are pack butt joints at short intervals, showing progressive building phases heading towards the face. The present passage height is c. 3.3-4.0m at the centre line and the floor has been partially infilled, with a tramway with wooden sleepers laid on top of the backfill. The pack walls are fully finished on the upslope side, while at the face end on the downslope side the pack was not finished.

The only specific features in this passage comprise wooden tramway sleeper slots for wooden sleepers. Discarded or stored items include a brazier, a carbide drum, a drill bit, and a wax taper.

The Working Face

Passage 14: Western Working Face

This long sinuous passage covers the updip half of the New Mine face. It is accessed by Cross Passages 5-8 coming from Inclines 1 and 2. It has two main lobes, with a naturally faulted/fractured zone between. The updip one was worked in 1952-64, while the down dip one is earlier, mined in 1938-45. In six places spaced along the face there are undercuts where the chert beds above have not been brought down; some are unfinished while others are vestigial left after the rock above has been removed.

The pack walls behind the face are of various stages of completion. Unfinished packs are common, and these include two large examples used as working areas. One of these was still in use when mining ceased and nearby

there is a working area with haulage bucket and rock on the floor that was in the process of being moved when worked stopped. The rocks have been split with plug and feathers. Some of packs contain 'megalithic' blocks.

In the last worked updip parts, the face passages are 4.5-5.0m high where not partly backfilled. Further downdip the face passages have largely been partially backfilled, with discrete mounds of material placed downdip of cross passages and other points; here the passages are more variable, at 5.0m to 1.1m high. One has a retained barrow-way. A short stretch of the face passage furthest downdip may have been filled to the roof but was later reopened to allow the venting of drilling dust. Another late ventilation measure, probably related to the first, was the placing of a brattice across the face passage at a corner further updip. Much of the floors and walls of the passage between the two are covered with drilling dust on the floor.

Specific features in this passage include timber roof supports; undercuts some with shotholes; unfinished packs, a haulage bucket and shovelling plates; roof lifting pins, one with a pulley, wall hauling pins, sites of other pins in roof and wall, and roof holes for lifting pins or wooden plugs; a retained barrow way; an air brattice; and several toilet areas. Parts of the 1953-54 face have drill steel testing holes.

Discarded or stored items include pieces of slow fuse, detonator wire, shothole stemming, gelignite wrapping papers, feathers, wire rope, oil drums, shovelling plates, threaded pipes, a scaffolding clamp, an iron bar, compressed air hose with connectors and Hercules clips, an iron bush, a pulley and a pulley wheel, shackles, haulage bucket chains, a drill steel, drill bits, a shovel blade, electrical cable and cable drum, a light bulb, part of a carbide lamp, a helmet cradle, chains and hooks, crowbars, roof bars, a spanner, cigarette packets, newspaper, broken tea mugs, sacking, boots, and a glass bottle.

Passage 15: Southern Working Face

This sinuous passage covers the bottommost part of the main underground mine face. It is accessed by Incline 2 and Cross Passages 9 and 10, and was one of two main areas last worked in this part of the mine, dating to 1948-58. There is one broad undercut where the chert beds above were never dropped and two shallow ones which are either vestigial parts of undercuts left after the beds have been dropped, or were the start of new ones.

The pack walls behind the face are in varying states of completeness. In the central section they are largely complete to the roof, with one small incomplete pack to the incline end, perhaps left because of lack of suitable stone. In contrast, at two areas at the far end of the cross passages there are working areas and large unfinished packs left when this part of the mine was abandoned. These are associated with a haulage bucket and nearby piles of rock on the passage floor which were in the process of being moved. The present height of the passage is c. 2.5 to a more usual 3.7m to 5.0m, but there is infilling rubble on the floor in parts. Some of the packs are particularly 'megalithic' and the large blocks often have evidence of plug-and-feather breakage.

Specific features in this passage include undercuts with shotholes and unfinished packs, one large one with a good set of timber roof supports; roof lifting pins, two with pulleys; a block with wire rope wear grooves; the haulage bucket; hanging pins in the packs; drip protectors; and shovelling plates. Various parts of the face have drill steel testing holes and drill steels. Raised planks with support packs and iron pins may be associated with this work.

Discarded or stored items include slow fuse and detonator wire, a metal bucket, oil drums, corrugated sheeting, wire rope, sacking and rags, drill bits, plugs and feathers, compressed air hose and Hercules clips, light bulb and packaging, electrical cable, metal labels, leather and plastic-coated gloves, cigarette packets, a bow shackle, a stilton, a spanner, a file handle, and a pickaxe handle.

Passage 16: South-Eastern Working Face

This sinuous passage is at the bottom part of the main mine. It is mostly accessed by Cross Passages 8 and 9 from Incline 2, and was one of two main areas last worked in this part of the mine, dating to the 1950s. The exception is a small earlier area at the northern end, of probable 1930s date, accessed by the rerouted lower end of Incline 1. At the 1950s reworked face area there is one broad top-cut where most of the chert beds below were never removed, and downdip of here also three shallow undercuts which are probably the start of new extensions to the workings that were never finished. One of these has a pillar supporting the rock above. Both the undercuts and the top-cut have shotholes.

The pack walls behind the face are in varying states of completeness. There are working areas and large unfinished packs left when this part of the mine was abandoned. These are associated with rock on the passage floor which was in the process of being moved and with leaving space on the pack top for a winch site. The

present height of the passage is 3.1m to 5.7m, but there is infilling of the floor in parts. Some of the packs are particularly 'megalithic'.

The southernmost part of the 1950s working face has been investigated through a naturally faulted/fractured zone using a coring drill; because the drill holes were never quarried away, presumably it was decided the rock here was not suitable for removal. In the roof there is an evaluation borehole, drilled from surface to test for the presence of underground workings.

Specific features in this passage include undercuts and an overcut with shotholes; unfinished packs, one large one with the site of a winch; roof lifting pins, a wall hauling pin, and a hanging pin; shovelling plates; and a small toilet area. Various parts of the face have drill steel testing holes and a drill steel.

Discarded or stored items include slow fuse and detonator wire, a grease tin, glass bottles, oil drums, corrugated sheeting, scaffold pole, wire rope, copper wire, a metal anchor, timbers, sacking, newspaper, a drill bit, a drill steel shank protector, an iron shim, a carbide dump, compressed air hose, with thread end and Hercules clip, a compressed-air dust blowing nozzle, cellophane wrapping for compressed air equipment, light bulbs and fittings, cigarette packets, a bow shackle and pin, a pulley, and a hammer handle.

Passage 17: North-Eastern Working Face

This long sinuous passage covers the downdip part of the Old Mine face. It is accessed by Cross Passages 11-13, while at the lower part it was once intersected by now-backfilled shaft to surface and presumably also the bottom of Incline 1 before this area collapsed. It may well be that this bottommost part of the passage, where there is a radical change in face direction, is part of workings accessed from Incline 1, created in the 1930s at a later date than the rest, much of which belongs to the 1900-22 Old Mine, except for a central section which was reworked from Incline 4 in a short lived trial in c. 1953-54. We know from the 1915-16 plan that the northernmost part of face 17 belongs to the c. 1912-15 block of extraction, while south of the later trial work, the long straight face was created in 1916-18 and/or in 1918-22, and was either the last working area before Pretoria Mine closed in 1918 or when it continued to be worked independently in the 1918-22 period.

The pack walls behind the face are different along lengths of the face, depending on the history of working here. At the very bottom, in the area probably accessed from Incline 1 and in work in the second half of the 1930s, the packs are not fully finished and work may well have stopped when a major collapse updip occurred. The present height in this part of the passage is up to c. 3.5m, but there is collapse rubble on the floor throughout. This comes from the major collapse immediately updip and its character shows there was catastrophic roof failure. Unstable voids above the rubble, created when the roof collapsed, can be followed upwards for a short distance, mostly ending at joints where solid faces of bedrock remains in situ.

Following the Passage 17 face updip there is a long section to the backfilled shaft dating to 1917-22 with carefully finished aligned packs, as if this was an access route from the shaft at the top end. There is one unworked top-cut at the very bottom, and worked vestiges of these further updip. At one point shale was intersected at a fault. This section of passage has been subsequently partially backfilled and the present height is c. 0.95-1.45m, except at the upslope end where it is 3.5m before reaching the area where the floor is buried under the cone of shaft backfill material. Why backfilling in this area ceased is unclear, but it may be that mining had stopped in this part of the workings. Near the downdip end, in two places, the old face has been re-investigated using a coring drill; because the drill holes were not quarried away, presumably it was decided the rock here was not suitable for removal.

Going updip from the shaft the passage has a typical sinuous face with an extensive 1953-54 reworking trial, which has topcuts with worked and unworked beds below. The main unworked one was at the updip end, which was the last part in work when the trial was abandoned. The packs behind the face are in various states of completeness. Some have blocks with plug and feather holes. The present height in this part of the passage is c. 4.10m-4.25m, with a bedrock floor visible in parts (except at the lowermost part, where it is only 3.25m but this part may well be part of the earlier workings).

In contrast with the last area, a short section of passage at the updip end of Passage 17, dating to the first decade of the 1900s is unmodified by later work and had been largely backfilled, to around 1.0m-1.5m from the roof; this fill was truncated by its removal at the lower end when the 1953-54 trial took place.

Specific features in this passage include good examples of timber roof supports at passage junctions, and on topcuts and unfinished packs; roof lifting pins and the sites of others, and roof holes for lifting pins or wooden

plugs; hanging pins and hooks in the packs and at a roof support timber; and an impromptu seat. Various parts of the face have drill steel testing holes. In the older passage down dip there is a small roof eye which may be an original survey station.

Discarded or stored items include pieces of slow fuse, wire rope, an oil drum, fishplates, small 'iron' hooks, thin zinc sheeting, a railway sleeper, a plank, corrugated sheeting, shovel handles, pieces of electrical cable and 'iron' chain, and a glass bottle. The shaft backfill contains a wide variety of later-20th century rubbish.

Passage 18: Northern Working Face

This long sinuous passage covers the updip part of the Old Mine face and is the oldest in the mine, dating from c. 1900-05. Except for a short but tall section at one end left open where it is accessed from Passages 11/28 and created in c. 1912-15, most is now accessed from via a low crawl at the side of the high section that is only 0.6m high at roof height; it is unclear if this entrance has always been open, or was dug out when the face was being re-inspected (see Passage 29). The passage beyond, for the most part, is a small retained access way for inspecting the face, sometimes with only a stooping height passage left open. It originally was accessed from the west rather than the crawl at the eastern end. Here there is a larger remaining chamber adjacent to backfill which sealed the passage when the surface quarry adjacent was in work in c. 1916-22. While the access route is usually 1.0 to 2.1m high, the chamber is up to 3.65m, although even the floor here is part backfilled.

The floor of the passage has been partly backfilled over much of its length and there are low pack walls at floor level crossing it. In parts there are vestiges of small top-cuts. The pack walls on the opposite side to the face are nearly all completed to the roof, but in one place two packs are not quite finished. At the western end there are unfinished packs in the larger chamber and in the adjacent access way.

Specific features in this passage include timber roof supports; small top-cuts with hand-drilled shotholes; unfinished packs; and a drill hole for a roof lifting pin. The one open part of the face, at the downdip end has drill steel testing holes. In the older passage updip there is candle soot and a clay deposit. Discarded or stored items include detonator wire and two anchor pins.

Unfinished Passage Infilling, Inner Workings and Abandoned Passages

Passage 19: Western Abandoned Passage Infilling

This small passage is in effect the space above an unfinished pack dating to the early-1960s, but it has a carefully laid floor over most of it, with alcove behind, which may well have been used as a working area and stores. The present roof height of the working area is about 4.25m, at a short step up from the adjacent face workings. The pack walls are only partially finished, with shelves and part-built examples in two directions. The whole of Passage 19 was presumably not filled because it was still in use when workings in this part of the mine were abandoned.

Specific features in this passage include roof lifting pins with shackles and pulleys. Discarded or stored items include a compressed-air dust extractor, chains with a bow shackle, rings and hooks, a crowbar, hammer head, oil tins, detergent tins, a threaded pipe and an oil drum.

Passage 20: Western Inner Working

This comprises two short and narrow interconnected passages, one originally at a 1938-40 face, the other on the updip side created in 1956. These were left open for access or inspection purposes, both adjacent to two small areas of un-removed bedrock associated with a naturally faulted/fractured zone, with their opposite sides defined by wall packs. The present height of the passages is about 2.1 to 1.2m and they have been partially backfilled. The original height was significantly greater and heaping of the backfill material in two phases is obvious, as shown by a significantly lower floor at the incline end. Holes in the waste rock fill against the rock wall in one of the passages can be seen going down for at least 2.25m. The backfill at the face working end has been retained by a low pack wall. The pack walls to the passage sides are fully finished to the roof, although one has now partially collapsed. Specific features in this passage include two roof lifting pins.

Passage 21: South-Eastern Inner Working

This passage for the most part comprises an abandoned 1930s working area against a bedrock island, the latter left either because it lies at the interface of 1930s and 1950s workings and/or because it is associated with unfavourable jointing or the fault at its north-western edge which crosses the mine from WNW to ESE. Access to this passage at the east end appears to have been backfilled but subsequently re-established by digging a way through packs; why this was done is unclear, but it is unlikely to be part of the recovery of waste stone as a product as found updip at Passages 24/25. It is more likely to have been to regain access for inspection purposes.

The height of the void is variable, up to 4.5m at the south end, with a middle section at 2.3-3.6m, but to the north it is as little as 0.8m where it has been dug through. The deep part of the void was perhaps left because around the corner a part filled section and adjacent top-cut were abandoned because of a roof fall; one pack wall remained unfinished here. At the time this area was being filled access was probably from the south end; this was subsequently blocked with a pack, followed by the reopening from the other end.

Specific features in this passage include two roof lifting pins and a wall hauling pin. Discarded or stored items include compressed air hose connectors, electrical cable, a light bulb and wire rope.

Passage 22: Southern Abandoned Passage Infilling

This passage comprises a part-infilled area with wall packs of earlier-1950s date, which was left unfinished, presumably because mining was abandoned in the adjacent part of the workings before it could be completed. A spade, seat and plank were all left in-situ, and this supports the idea that this area was left with no prior notice. The 'passage-like' route used with faced packs to either side is probably a product of ongoing pack building to either side rather than this being a fragment of an earlier and much longer access through-route. The present height of the passage where these is wheelbarrow access is about 1.4m high and the floor has been significantly infilled previously as part of the pack infilling process. The pack walls are fully finished to the sides, but at the inner end they are not, and infilling was clearly part of a planned retreat outwards. In the adjacent Face Passage 15, stone from Face Passage 16 continued to be dumped between 1954 and 1957, largely burying the shovelling plate at the entrance to Passage 22.

Specific features in this passage include a long barrowing plank, a makeshift seat and an adjacent shovel; and an earlier roof lifting pin. Discarded or stored items include a bow shackle, and a metal anchor.

Passage 23: Eastern Abandoned Passage Fragment

This comprises two fragments of abandoned passage with wall packs with a small chamber between where the roof has collapsed to fill the passage below. Its northern passage is on the 1915-16 plan and was created in around c. 1910-12, while the southern passage is presumably of 1920s-30s date. The very unstable and part-collapsed passage adjacent to Incline 1 was originally either a cross passage or working area, while the passage north of the collapse was a cross passage with floor at a higher level because of backfill here, designed to run horizontally for taking material from the working face to Incline 3 for haulage to surface. There is no indication of the nature of the passages under the collapse chamber rubble derived from an unstable roof, but there was presumably a relatively wide open area here for the collapse to have occurred. The pack walls are fully finished, except where robbed. Specific features in this passage include a drilled hole for a roof lifting pin. There is also a discarded carbide drum with deposition post-dating the collapse.

Passage 26: North-Eastern Abandoned Passage Fragment

This comprises a short fragment of abandoned passage with wall packs and is of 1916-22 date. At the eastern end there is the backfilled shaft to surface and the passage was presumably for access and/or ventilation. Its character is somewhat confusing because half way along there is a pack across it, while beyond the pack to the west two pack walls again define what appears to be a roadway. It may be that the sealing pack is a later in date, blocking the passage at a time when access to the shaft was no longer needed. While Passage 26 aligns roughly with Incline 3 it is unlikely to be the bottom end of this, because there are further packs across the line, visible in Passage 25. Thus it may be that Passage 26 was a short link created at the time the face was advanced south-eastwards and the bottom shaft sunk, connecting this with the pre-existing bottom face passage that is shown on the mine plan of 1916, which was soon abandoned as the previous face passage was backfilled as working continued down dip in 1916-18 or 1918-22.

The present height of the fragment of Passage 26 near the shaft is about 2.4m and even here the floor has presumably been partially infilled; the pack walls to the sides here are fully finished. The pack wall that crossed the passage half way along its length has had a hole dug through it allowing access today from the west that is just under 1.0m high; this appears to have been created when the pack robbing of Passage 25 was taking place, regaining access at a point in time close to when the stone recovery operation was abandoned. Specific features in this passage include a drill hole for a roof lifting pin and a roof plug that perhaps held a survey station.

Passage 27: Northern Abandoned Passage Fragment

The character of this short but complex area of passages is difficult to interpret. It appears to be primarily an area where pack creation of c. 1916-22 date did not fully fill the passage, leaving a void at the bottom of Incline 3, with the pack walls with a face to the downdip side built after this incline was abandoned. These pack walls appear to have once been complete, but were broken through again in two places when the much later stone

recovery at Passage 25 was undertaken; how much stone from behind the pack walls was taken from Passage 27 is unclear, although this is perhaps unlikely to have been much, given the difficulty of moving it through the low openings. These are less than 1m high and just below the roof, with a drop down into Passage 25. However, some was certainly taken, because the small passage at the eastern end is almost certainly a small exploratory trial created to test the character of the deads in this direction.

Passage 28: Northern Face Link

This short but high passage, with pack walls to either side, is designed as a link to the working face from Cross Passage 11. It dates to c. 1912-15 and is shown on the 1915-16 plan. There is one pack butt joint on the down-dip side showing progressive building heading towards the face. The floor has been partially infilled, with a surviving wooden sleeper showing that a tramway was laid on the backfill top. The pack walls are fully finished. Specific features in this passage include the wooden tramway sleeper; timber roof supports; a drill hole for a roof lifting pin; a hanging pin; and an iron wedge.

Pack Removal

Passage 24: Western Pack Removal Passage

This is similar to that at Passage 25, perhaps started earlier, but in the case of Passage 24 soon aborted. The date of this episode of work is uncertain but is likely to be later-1930s or earlier-1940s. The passage was created by purposeful linear removal of deads, made as wide as seemed practicable in terms of roof stability, taken forward from the side of the incline following the contour so that removal was always along a horizontal route. However, a short distance from the incline they hit a bedrock face and, although they trialled above it, they appear to have decided to continue the stone getting venture elsewhere, presumably moving to Passage 25 a short distance down the same incline. The present height of Passage 24 is about 3.0m. Specific features in this passage include two timber roof supports.

Passage 25: Eastern Pack Removal Passages

There is no evidence that there was ever an access roadway at this long robbing passage prior to the deads reworking and given the disposition of the remnants of pack wall this seems highly unlikely. The date of this episode of work is uncertain but is likely to be later-1930s or earlier-1940s. Again purposeful stone removal was taken into the deads in a linear way, taken forward from Incline 1 following the contour for ease of stone movement. The new passage was made as wide as seemed practicable in terms of roof stability. The present height of the robbing passage is about 2.9m to 3.6m, with this increasing with distance away from the incline.

At the end, and at two places at the sides, they broke into remnants of pre-existing passages (Passages 23, 26, 27). The pre-existing packs are often cut through leaving unsupported steep faces of deads that are angled just enough to prevent collapse. In places lines of boulders (Features 12, 29) were put to the sides of a central access route to help keep this clear of stone falling from the robber faces. The old deads have frequent truncated retaining pack walls running at all angles, illustrating the complexity of the stacking process when this area first had chert beds removed. Elsewhere in the workings this is usually hidden by the linear order of the pack walls where they line access routes running away from the remaining face zones. There are vestiges of a tramway laid along the passage to facilitate stone removal. In the roof there is a borehole drilled from surface.

Specific features in this passage include a short section of retained tramway route close to the turntable in the incline, and a single sleeper slots further in; timber roof supports and wooden cleats in a roof joint; roof lifting pins and sites of others; a roof plug for electric wiring; and hanging pins on one wall.

Discarded or stored items include dog nails, a fishplate, wire rope, a boot and a shoe, a corrugated sheet, a cold chisel, a chain and a carbide dump. Further discarded or stored items are near the entrance and are likely to relate to activity in the incline after Passage 25 was created. These include an electrical cable insulators, a tub connector link, sheets of plain paper and newspaper, an iron bolt, a plug from a plug and feather set, a cigarette packet, a slow fuse and two drill bits.

Passage 29: Northern Pack Removal Passage

At this passage packs have only been partially removed, down to a depth of 1.7m to 1.2m below the roof, with the space decreasing as the passage progresses. There is an uneven and uncomfortable floor of deads throughout. While the possibility that this passage was a secondary working similar to Passages 24 and 25 cannot be fully discounted, where deads were being taken out to be sold as a product, this seems very unlikely. If this was the case then the deads would have been taken down to a sensible 'floor' level matching that at the top of the incline. Rather, the passage may be a trial for testing the character of the stone, or more probably one made by miners searching for the face in this part of the workings long after it had been hidden behind packs.

The passage is relatively wide, presumably because this width was needed to prevent burial of quarrymen from collapses of unsupported sides as work progressed forward. A series of earlier pack walls have been breached as this happened. Several timber roof props, some or all resting on the 'tops' of robbed walls, were added as a safety measure. The passage seems to have been created sometime well after the inclines were in place, so presumably after 1922 when the New Mine opened, but certainly before the winch on concrete plinth was placed here for the 1953-54 trial facework further down dip, as shown by the winch roof remaining in place rather than removed for creating the passage behind. The most likely date is the late-1930s or early-1940s, done as preliminary exploration work prior to the trial reworking of the Old Mine.