

MINE HAZARDS

1. INTRODUCTION

Abandoned mines contain many more dangers than natural caves. Remember that they may have been abandoned for many years and little or no maintenance will have been carried out since. Unlike natural caves, passages and chambers have been cut artificially and points of weakness may have been shored up temporarily for the period of working. Remember also that mines can be just as dangerous on the surface. You should be aware of all the following hazards in a mine – how to spot them and when to avoid them.

2. SURFACE HAZARDS

a) Open Shafts & Stopes

Most people have seen an open mine shaft but another hazard is where an underground working (stope) has been worked close to the surface and has broken through, leaving a wide and deep hole. A common danger with both shafts and open stopes is 'crowning', where the surrounding ground falls into the shaft leaving a steep sided crater. These features may be unfenced or, even if a fence was put up, this may well be falling down. The location of these open features may not always be obvious and they can be found in woods or amongst bushes. Anyone exploring the surface of an abandoned mine should look very carefully where they are going.

b) Unstable Spoil Heaps

Waste material from the mine was dumped on spoil heaps, some of which are quite big. Try not to go on these features since they can be unstable and an unwary foot can cause a landslide. Slate mine spoil heaps are especially dangerous since the slate slabs can easily start sliding down over one another like a toboggan, causing injury to anyone below.

c) Wheel Pits

These were masonry-lined pits sunk to take waterwheels that operated mine machinery or pumps. Some are quite deep and the edges can crumble, causing the unwary to fall in. Even if the fall does not cause injury, it may prove difficult to get out again.

d) Disused Buildings & Machinery

Old buildings will now be decaying and roofs and walls may be ready to collapse. Machinery will now be rusty or rotten and it can easily break, leaving sharp surfaces. Inspect the features by all means but never climb on them.

e) Flooded Workings

When a mine or quarry was working they were likely to have used pumping gear to remove water from the workings. Abandoned workings will no longer have active pumping and so may have flooded to the surface leaving very deep pools of cold water that are likely to contain much in the way of entrapment hazards.

f) Slime Dams & Settling Ponds

During the 20th century, improved processing techniques meant that the waste product of metal mines was fine diameter material resembling sand. This was usually pumped to a large pond called a slime dam, where the water was allowed to evaporate. This process took some time and a crust formed on the surface first, similar to ice on a lake. The material underneath can be likened to quicksand so never walk on a slime dam or you might fall through.

3. UNDERGROUND HAZARDS

a) Unsafe Entrances

The rock strata exposed at entrances is subject to freeze-thaw damage during winter when water gets into the fissures and pushes them apart as it freezes. This can eventually make the entrance unstable or even collapse so always check closely before entering. In a similar way, always check that, if some form of support has been installed at the entrance, it is doing its job.

b) Bad Ground

When driving access passages, miners often drove through soft strata like shale for speed and economy. Shale can be hard when freshly cut but becomes friable when exposed to air. This causes it to split and fall from the roof and sides in large lumps. Faulting was also a common feature found in the rock and, when unsupported, earth movement can cause large sections to become detached. Never enter workings where there have been obvious roof falls or where the roof or sides show signs of splitting. You should also prevent novices from hammering rock faces where there is any sign of faulting.

c) Roof Supports (Stemples)

Metalliferous and slate mines were usually driven in hard rock and most excavations did not need any support. If the miners placed roof supports there was obviously a particular reason for it. Roof supports were usually made of wood because they only need to last for the life of the workings. After many years of disuse, these supports may have rotted or fallen away, leaving a potentially dangerous roof unsupported. Never touch any supports still in situ since the movement may cause them to collapse.

d) Stacked Deads

Miners often left waste rock underground to save the trouble of taking it to the surface and sometimes used it to support the roof. This rock, called 'Deads', was often stacked on timbers in the roof or built up as dry stone walls in the sides of passages. Never touch or climb on deads or you may bring down the roof onto the heads of yourself and others.

e) Stopes

Stopes are large open areas where the miners have removed the ore from a vein or lode. Their working life was fairly short since the miners moved on to another area once all ore was removed and they rarely installed permanent roof supports. Stopes may be divided by false floors or contain stacked deads held up with stemples. Stopes can be high or extend a long way beneath you. They are frequently encountered completely or partially flooded.

f) Hoppers

Hoppers are wooden containers which were built at the bottom of a chute from a stope above. Rock was thrown down into the hopper and held back by wooden boards. When required, the boards were carefully removed and the rock allowed to spill out into wagons on the level below. There is often a great deal of loose rock jammed behind these hoppers so never interfere with them or it may spill out on top of you.

g) False Floors

Miners often made false floors by building timber roadways over a stope. These are not always obvious since they may have been covered by mud and rocks and even hold water. If timbers have rotted you risk falling through into the stope below. If the floor feels shaky or hollow turn back. Listen to the sounds beneath your feet.

Information for those wishing to lead in underground environments.



h) Shaft Tops

Shafts often have dry stone walling at the top called 'ginging' to hold the loose soil back between the surface and the bedrock. When descending or ascending, beware of touching this in case you cause it to collapse. Some ginging was supported on a wooden collar which is likely to have rotten or fallen away leaving it unsupported. Never stand on the edge of a ginged shaft, if you must look down then get someone to lifeline you, lie on the floor and peer over the edge. The tops of large shafts can also be timbered over leaving a small access hole. Beware of standing on this timber which may be rotten.

i) Flooded Shafts

When wading through water, beware of flooded shafts in the floor. After the first person has passed, the water becomes muddy and you cannot see anything. Shafts are often to one side of a passage so you may miss them on the way in but find them unexpectedly on the way out! If a flooded shaft is seen, the first person should pass a warning back along the line and mark the position for the trip out.

j) Submerged Obstacles

In deep water, keep to the sides of the passage where it is often shallower and (if in solid rock) you can steady yourself on the walls. It is common to come across submerged rocks, pieces of machinery or sharp metal on the floor of flooded passages. If you find any of these, pass a message back. Go at the pace of the slowest person. Never race and never swim underground.

k) Stemples, Ladders and Staging

In some mines, ladders were used to get from one level to another, with wooden platforms called stagings at intervals. In other mines, timbers called 'stemples' were jammed across shafts to climb on. All such structures are now suspect since the wood is probably rotten so never climb on any ladders, platforms or stemples left in a mine.

l) Old Machinery

Old machinery left in a mine is probably badly weakened by rust or decay. Apart from the fact that it destroys important artefacts, climbing on old machinery can cause serious accidents.

m) Explosives and Detonators

Although gunpowder was originally used, mining in this century used other types of high explosive. These were sometimes left underground on abandonment and novices may mistake them for fat candles. Although some explosives become harmless with age, research has found that others can re-combine chemically to form just as great a danger. They are usually short, fat cylinders wrapped in brown greaseproof paper and are sometimes discovered in boxes or tins. Detonators can be equally dangerous, even after being left for a long period. They can be found in small square tins. NEVER touch anything that looks like explosives or detonators. Make note of their position and tell your Regional Caving Council.

n) Poor Ventilation

If you are in a mine with only one entrance or where workings descend beneath the lowest entrance, there is a possibility of bad air building up in low points or the far reaches of the workings. Even in a well ventilated mine, there may be places where bad air builds up, e.g. blind shafts, inclines or long levels. In some large mines, the miners directed ventilation to the latest workings by installing air doors or filling up abandoned levels. In such cases, the older workings may not have a good air flow.

Information for those wishing to lead in underground environments.



o) Pollution

Open shafts have long been a tempting place for farmers etc. to dump unwanted chemicals, dead animals, scrap, etc. If someone scratches themselves when climbing over such material, there is a danger of poisoning or disease. Keep away from such material at the bottom of shafts.

p) Weil's Disease

This is a bacterial infection spread by rat's urine and it can occur in water draining into mine workings from farmland or other areas of human habitation. It enters the body through cuts in the skin or via the nose, throat or other body openings. Symptoms resemble a flu attack but serious illness or even death can result. The incubation period can be from 3-19 days and early symptoms are fever, muscular aches and pains, loss of appetite, vomiting and lethargy. Later symptoms are bruising of the skin, sore eyes, nose bleeds and jaundice. If you develop the above symptoms after a mine trip, tell your doctor and tell him you have been in contact with Weil's Disease. He will arrange for a blood test. A small plastic card with details of the above is available from the BCA.