

HAZARDOUS

IN THE FIRST OF TWO ARTICLES ON THE DANGEROUS CONDITIONS OF WORK, THIS ARTICLE EXPLORES SOME OF THE RISKS TO HEALTH AND SAFETY EXPERIENCED BY WORKERS

Occupationally speaking we can divide our working history (and indeed pre-history) into three ages: The age of the hunter-gatherer; the age of farming; and the age of industry and globalisation. Which of these ages produced the worst occupational health and safety nightmares?

Gamblers might put their chips on number 1 – the age of hunter-gatherers, especially the hunting. Sprinting across uneven ground, eyes fixed on their prey, it would surely be a fertile source of slips, trips and falls. Fighting prey and carrying the slaughtered beast back to camp would be an ergonomic disaster area. And in this pre-antibiotic era, any infection of a tooth, claw, tusk or horn-inflicted laceration could be fatal even if the original wound was not.

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But on the other hand, hunter-gathering did have its health and safety plusses. It was, anthropologists believe, a very egalitarian occupation. This arose from the fact that animals and plants can only support small numbers of people; too many would eat up all the resources, so the hunter-gatherers tended to operate in small family groups. Large scale hierarchical organisations and rigid time management were yet to appear. Hunter-gatherers would have been strangers to modern stress.

In addition, given a plentiful environment, hunter-gathering could be light work. Certainly the advent of farming meant everyone had to work harder.

Thirdly, and perhaps most importantly, nature honed our bodies into perfect hunter-gatherer machines. As far as hunting was concerned, men's bodies were perfectly tuned to a fight or flight lifestyle consisting of bursts of high activity punctuated by periods of rest.

Of course there is no such thing as a free lunch and today's workers have picked up the tab. We still have those hunter-gatherer bodies but now they are shoe-horned into jobs for which they were never designed. Lack of control over the way we work crushes our spirits, long hours, shift work and hours in front of VDUs eat into our physical and mental health. Fight or flight has turned from friend to foe, racking us with stress and heart disease. Maybe one day we will evolve to the jobs we

do now but that is unlikely because the nature of work is changing so rapidly. This legacy is the major health and safety significance of the age of the hunter-gatherer.

But even in Paleolithic times, Stone Age hunter-gatherers were planting the seeds of today's problems. This is because they never just hunted or gathered. Some became skilled at knapping flint. They learned how to bang stones together, fashioning hand axes from the core and blades and spear tips from the resultant flakes. The physical banging may have caused humanity's first RSI; the stone dust its first silicosis. These were probably the worst jobs in the time of hunter-gatherer and evolution would have left them ill-prepared for the prolonged and sustained effort required.

THE AGE OF FARMING

Nor would evolution have prepared us for the age of farming. Ploughing and harvesting were hard and back-breaking work. It all began about 8,000 years ago in the new Stone Age (Neolithic) period. Although men did the hardest tasks, women did not escape entirely. For them, the Neolithic revolution was, quite literally, the start of the daily grind, as they now spent several hours every day preparing grain for eating. First they pounded the grain using a mortar and pestle to remove the outer husk and release the seeds, then they ground the seeds on a

saddle-shaped stone with a rubbing stone to make flour. They had to kneel to do both jobs. It took its toll but only now do we realise just how much.

Studies carried out on the bones of some of these women show that repeatedly pushing the rubbing stone backward and forward had crushed the vertebrae in their lower backs. Kneeling had enlarged their knee joints, and their big toes were arthritic from being curled underfoot to help provide push for the forward grind.

What the shift to farming did produce, however, was surplus. This meant that not everybody had to work simply to provide food. From kings to cobblers, some of us could devote our working lives to getting good at just one job instead of having to be jacks of all trades.

As a result, cities and kingdoms and empires grew on the backs of the 80% who still worked the land. These kingdoms and empires fought wars and the defeated became slaves. It was the slaves who had it worst and their jobs did not just ignore health and safety. They declared war on it.

Mining is the prime example. Mines became more important as stone gave way to bronze and bronze to iron. But being sent to work in the mines was, quite literally, a death sentence.

A Greek historian named Diodorus Siculus visited Nubian gold mines around 50 BC. In an account attributed to him, he described the conditions faced by the slaves working there. He notices that all the



► Illustration of a sectional view of a mine, taken from Agricola's *De Re Metallica*, published in 1556.

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ONS WORKERS HAVE FACED THROUGHOUT HISTORY, NICK COOK
NCED BY OUR PREHISTORIC ANCESTORS UP TO THE TUDOR AGE.



► This relief from the tomb of the Pharaoh Horemheb depicts a group of imprisoned slaves surrounded by guards armed with clubs.

slaves are fettered and comments that there is no point in trying to talk to the guards or to bribe them to go easy because they are all foreign mercenaries.

The rock containing the ore was even less amenable than the guards. It was so hard that the only way to break it up was to first light a fire beside it and then throw water on the heated rock. This caused it to crack. The softer rock was then worked by thousands of slaves using tools.

Underground galleries followed the seams which were lit by lamps attached to the slaves' foreheads. The fragments of ore were thrown to the floor and collected by children who had to carry them all the way to the surface. Blows from the overseer ensured that everyone worked ceaselessly. In the words of Diodorus Siculus, "...there is no forgiveness or relaxation at all for the sick, or the maimed, or the old, or for women's weakness, but all with blows are compelled to stick to their labour until they die in servitude." No wonder that the slaves saw "death as more desirable than life."

The Greek, and later the Roman, ruling elites despised manual work and this was reflected in their attitude to the workers. However, there were exceptions, for instance the Roman Emperor Hadrian insisted that trapeze artists should practice with a safety net. But even this foray into enlightened concern is undermined when we learn that this was the same Hadrian who, in a fit of temper, stabbed a slave in the eye with a writing stylus.

In Greek and Roman times most mine workers were slaves or forced labour. But in later periods, even when this was not the case, mining remained a horrendously

risky and extremely unhealthy life. In the 16th century, Agricola wrote *De Re Metallica*, a work describing mining in central Europe. Little had changed in the 600 years since Diodorus.

The practice of heating the rock and throwing water on it to break it up was still in use and Agricola describes how it created poisonous fumes which killed miners. He also comments on the dust which, when stirred up by digging, "penetrates the windpipe and lungs and produces difficulty in breathing" and eventually "eats away at the lungs and implants consumption in the body." He concludes by observing that "in the mines of the Carpathian Mountains women are found who have married seven husbands, all of whom this terrible consumption has carried off to a premature death."

But there was one important difference, in that Agricola actually tried to do something about it, recommending better ventilation and the use of veils as dust masks.

TUDOR ENGLAND

By Tudor times, material progress was surging ahead but the same cannot be said for health and safety. Tudor England had some of the worst jobs and one of these was the job on which the iron working revolution depended; charcoal.

Smelting and working iron requires higher temperatures than copper or tin and charcoal helped to achieve that temperature. Right up until Tudor times when it began to be replaced by coke, charcoal played an

important role in man's exploitation of this metal.

But producing the charcoal was hard and unhealthy work. The charcoal burner would prepare an igloo-sized mound of wood, cover it with earth leaving a small hole at the top. He would then drop some burning coals in the top and when the wood started to catch, he would plug the hole. The trick was then to watch the stack, taking care to ensure that the charring of the charcoal occurred in a controlled way.

This would take a long time and meant that the charcoal burner had to stay awake for four or five nights. Even when the charring was complete and the stack had been extinguished with water, the unfortunate charcoal burner still had to stay awake for another twenty four hours while it cooled. Falling asleep at any stage could result in all the work going to waste. To make sure this did not happen, he sat on a one-legged stool while watching for fire.

Understandably the charcoal burner's job was a solitary one. The growth of towns and cities which grew in the wake of the Neolithic revolution meant that rather more people lived in closer proximity to each other than perhaps they would have liked.

This discomfort was exacerbated by the sanitary arrangements – or lack of them. In Tudor times London's population grew 400%, making things even worse.

None of us would like to be accused of simply going through the motions in our work. The Tudor gong scourer (or gong farmer), however, was paid to do just that. Many public loos were built over streams and rivers but large numbers of private houses had their loo seats over cess pits. It was the gong farmer's job to empty these. They were only allowed to work at night, and did so by the light of tallow candles as there were no street lights. First they would use buckets to remove the top, liquid layer. Then they would have to get into the pit to shovel out the excremental sludge at the bottom. Occasionally they would come across the corpses of unwanted babies. All the sludge went into a 'pipe' which was carted outside the city limits by horse.

Health was a major issue. Gong farmers' eyes would be affected by ammonia, with some even going blind. Others were asphyxiated. The likely culprit here was hydrogen sulphide, the 'bad egg' gas that used to emanate from stink bombs.

Although most people worked on the land, the age of the farmer saw a proliferation of non-agricultural jobs to meet the needs of an increasingly complex world. Many were health and safety horror stories; we have seen just a few examples.

It could be argued that hierarchical structures such as the Roman Empire, feudalism, and the nation states were almost specifically designed to keep people working in unsafe and unhealthy jobs. Society depended on them. With the dubious exception of Hadrian, nobody in power seemed to care much about the workers. The craft guilds which grew up in medieval times cannot be compared to trade unions as their function was mainly to protect their respective trades. Campaigning trade unions and government health and safety legislation had to wait for the third age of work. But not before the appearance of some even worse jobs.