A Little Light in the Darkness The Life and Times of John Buddle



By David Kidd

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The Life and Times of John Buddle Mining Engineer, Scientist and Local Hero 1773 - 1843

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<u>Abstract</u>

John Buddle was a witness to history. His Journals and Diary contain accounts of the development of railways, terrible pit disasters, the building of the new port of Seaham Harbour, and shed new light on the early history of iron shipbuilding on Tyneside. They also tell the story of his love for his sister Ann and of his stormy relationship with the aristocratic Durham Coalowner Lord Londonderry.

This book is a snapshot of Buddle and his world, it tells the story of the great and mundane events of his life in his words, and makes his diaries available for the first time to a wider readership. Buddle is now almost forgotten but in his own day he was a celebrity, a local hero, and he was at the centre of the development of the safety lamp, the steam locomotive, and the foundation of the first iron shipyard on Tyneside.

The diaries also contain much of human interest. The story of the marriage of Charles Steward who later inherited the title of Lord Londonderry to the Durham coal heiress Frances Anne Vane Tempest could have come from the pages of one of the great Nineteenth Century novels. Buddle's account of the disaster at Heaton and the failed rescue attempt is an epic story of courage and tragedy which matches Franklin's and Scott's lost Arctic and Antarctic expeditions, while John and Ann Buddle were one of the great Brother and Sister partnerships of the Nineteenth Century equal to Dorothy and William Wordsworth.

Dedicated to my Parents

who encouraged my interest in History

and

to

Ann Buddle

the unsung heroine of this story

<u>Acknowledgements</u>

This book could not have been written without the help of Jennifer Kelly the Librarian of the North East Institute of Mining and Mechanical Engineers which holds John Buddle's papers.

In the course of my research I was fortunate to meet Jane Woolley, a direct descendent of John Buddle through his nephew Robert Atkinson. Jane read the first drafts of this book and offered many helpful suggestions as well as sharing useful information from her research into the history of her family.

I was also fortunate to meet Judith Green and benefit from her work at St James Church Benwell. Without Judith who organised volunteers to maintain the graveyard where John and Ann Buddle are buried and raised money for the reroofing of the church the future of St James would have been very much in doubt and this important link with Buddle might have been lost.

The many errors of course are entirely my own responsibility. This is a new work and corrections and comments from readers are welcome.

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Abbreviations

BJ Benwell Colliery Journal

EM Essays on Mechanics and other Useful Knowledge

HJ Heaton Colliery Journal

HM Hebburn Colliery Memorandum Book

JJ Jarrow Colliery Journal

LJ Lambton Collieries Journal

PB Placebook

MJ Medomsley Colliery Journal

WJ Wallsend Colliery Journal

A note on the text

References in this book to John Buddle or just Buddle refer to John Buddle Junior 1773 - 1843.

His father who was also called John Buddle and died in 1806 is referred to as John Buddle Senior or Buddle (S)

In the extracts from the diaries the original spelling and punctuation is preserved as far as possible to make sure the authentic voice of John Buddle himself can be heard.

Introduction

This book makes a bold claim. John Buddle never claimed to have invented anything yet he was central to the development of the safety lamp and the involvement of Sir Humphrey Davy stems from Buddle's conviction that the application of science was the way to make mining safe. Buddle worked with Davy on the lamp, supplying specimens of mine gas and testing the prototype and the account in his diary of the Hebburn disaster of 1810 show that he was interested in exactly how mine gas fired long before the Felling disaster of 1812 which led to the formation of the Sunderland Committee.

Buddle's promotion of the safety lamp in the collieries he managed stemmed from a deep concern for the lives of the pitmen who worked for him. John Buddle saw more men die than any normal human being should and reasonably expect to remain sane. Unlucky, tragic, careless, heroic and ultimately pointless deaths fill the pages of his diaries, the deaths of people he knew, people who were his responsibility. He was not as is sometimes suggested a callous or unfeeling man for whom the deaths of pitmen was just another cost of mining in pits which were literally death traps.

Buddle's diaries show he went to extraordinary lengths to protect his men and he was above everything else a great leader whom the men trusted and would follow anywhere. When fires and explosions ripped through mines Buddle was always at the head of the rescue, but he knew that courage, and he had plenty of that, was not enough. He documented the deaths of his men because he wanted to understand how accidents happened and more importantly how they could be prevented. Colliery disasters he knew were not acts of God, they were caused by natural forces and with knowledge and understanding they could be minimised if not avoided. While inquests on mine disasters were still recording verdicts that no blame could be attached to anyone for the slaughter in the pits which was the result of an unfathomable act of God Buddle was presenting Scientific Papers on the cause of explosions and how they could be prevented.

The safety lamp was only a small part of his efforts to introduce science into mining. Buddle kept a barometer in his office at Jarrow and when pressure was low he put the pit in a high state of vigilance with deputies watching the return of air at the furnace so the men could be withdrawn at the first sign of danger. Jarrow was a dangerous pit, but Buddle's methods saved more lives than were lost and averted at least one major disaster where more than a hundred men could easily have died. The tragedy was that so many were lost.

When Buddle managed at last to enter the workings at Heaton after an epic nine month battle against the water that drowned the pit and recover the bodies of seventy five men and boys killed by a flood of biblical proportions he was not just trying to save the pit. He wanted to know if the men suffered before they died, and give them a decent burial for the sake of their families; it was compassion that drove him on at enormous cost even after all hope was gone. The disaster happened when the men at Heaton broke through into old flooded workings and Buddle proposed afterwards that there should be a central repository of the plans of old mines which could be consulted by mine owners and viewers so that such disasters could be avoided in future. Unfortunately it took a hundred and ten years and the deaths of thirty eight pitmen in the Montagu Colliery disaster for his suggestion to be fully implemented.

Buddle was interested in this world not the next, and he believed it was his duty as a master, as an educated man, and a scientist to do everything he could to reduce the terrible loss of life in the mines. The simplest solution would have of course been to close the pits, with the technology available in the first half of the Nineteenth Century coal could not be mined safely from the fiery seams of Tyneside, but to Buddle that would have been a retreat from progress, civilization and human destiny. He once described his pitmen as foot soldiers of the noble House of Wynyard (Lord Londonderry's mansion in County Durham). Buddle was a great leader, and the military metaphor is a good one, even if it accepts the inevitability of casualties. Mining for him was like war, a dangerous activity with unavoidable risks but great rewards, and like a general in battle he had clear aims, a plan of campaign, and the charisma to get others to follow him.

Buddle like his father was a mathematician and he was born in one of the great ages of mathematics. Newton mechanics had shown that the Universe was just a great machine and Buddle believed that with mathematics everything could be understood, that everything could ultimately be reduced to calculation, to numbers. Even the workings of human character itself he thought could be attributed to the shape and structure of the brain as the new "science" of phrenology was beginning to Music was in Buddle's view demonstrate. the highest artistic accomplishment of the arts and yet it was essentially a mathematical system of harmony and order reflecting the order of the Universe. If only all human activities could be organised rationally he believed as a Unitarian then surely happiness and fulfilment for all would be the result.

Buddle's approach to life emphasised discovery and explanation, intervention and solution, rather than contemplation and acceptance. Buddle was a practical man and his diaries are full of practical things, but behind the steam engines, the railways, and the steamships which were the centre of his attention throughout his life there was his unshakeable belief in the future and his part in it, his mission. He never stopped working and in his late sixties he was as enthusiastic about steamships working with John Coutts the pioneer iron shipbuilder on the design of iron steamships, as he was about railways thirty years earlier working with William Chapman on the design of the pioneering steam locomotive the "Steam Elephant".

John Buddle died suddenly and unexpectedly after being taken ill while out riding, with his life from his point of view even at seventy years old still incomplete, reading his diary which stops abruptly in October 1843 it is obvious there was so much he still wanted to do. He would have regretted in particular that he never saw the completion of the revolutionary steam collier he worked on with John Coutts whose yard was near to his house at Wallsend. Death was something that was Buddle's close companion all his life in the pits, but though he came close on at least one occasion in an explosion at Wallsend on the second of February 1807 he died in his bed. John Buddle did not fear death, indeed he had a certain fascination for it in all its forms, and he was buried in a vault he designed himself, on land he donated to the church at Benwell for that purpose. The donation of the land for St James Church by a Unitarian who was not a member of the Church of England seems surprising, but Buddle had his reasons. The vault is sunk into the High Main Seam, uniquely near the surface here, so that he could be buried in coal, certainly sacred ground for a mining engineer who spent much of his life underground.

The story of John Buddle's life, like all human life itself, is ultimately a tragedy. Like the story of the great northern coalfield itself, Buddle's life is an inspiring story of courage, enterprise, and invention, but it is also at its heart a gothic horror of inhuman suffering and death which blighted the lives of thousands of ordinary people. Pitmen died then as always broken in falls of stone, choked by suffocating gas, trapped and drowned by biblical floods, and burnt and blasted by deadly explosions, but what happened in Britain at the first half of the Nineteenth Century due to a deadly combination of the spiralling demand for coal, the need to work deeper seams, and the technical inadequacy of mining was a crime against humanity, and extraordinary circumstances breed extraordinary people. Few other people in the history of the world can have faced death on a daily basis like the pitmen of the first half of the Nineteenth Century. John Buddle was there, he saw the horror at close quarters and described it without embellishment in his diaries, surely one of the greatest documents of British History, comparable in scope and importance, if not in literary quality, with Samuel Pepy's accounts of much lesser events than the human face of an industrial revolution which changed the face of the world.

Miners were explorers in an unknown realm filled with danger more perilous than the Arctic or the Antarctic, they were the foot soldiers of a battle with the implacable forces of nature more powerful than any of the armies at Waterloo and Trafalgar, and they died in greater numbers proportionally than the victims of any plague since the Black Death. John Buddle documented their story. In just twenty years one hundred men and boys representing fifty per cent of the workforce and one quarter of the population of the historic village of Jarrow, once the home of Bede whose church overlooked Jarrow Pit, were killed in four explosions as they dug coal out of the fiery Bensham Seam. The story of Jarrow, told in great detail in the five volumes of John Buddle's diaries is the story of mining in the first half of the Nineteenth Century, a story as inspiring and as costly in human life as the search for the North West Passage which was capturing peoples imagination at the same time. John Buddle's Diaries bring that story to life, a story of leadership, courage, and heroism, and a story of technical innovation and progress, which has few equals. It is the story of Tyneside in the Nineteenth Century.

John Buddle never claimed to have invented or discovered anything and so he is largely forgotten in an individualistic age where the identification of who was first matters most, yet he was deeply involved in the development of the safety lamp, the railway locomotive, and the steamship, and he was a real pioneer in the new science of Geology. His was a cooperative enterprise, and he saw inventions and discoveries as the work of people working together like the production of coal in a pit in which everyone played their part. In his darkest moments he saw his fellowship with the pitmen, one of the things he valued most in life fall apart, broken by the great strikes of 1831/2 when the men he had worked with all his life hung his effigy in the pit yard at Wallsend, but to his everlasting credit that he found a way back. John Buddle's life is a very human story that could have ended in 1832 with depression and despair, but nursed back to mental health by his devoted sister Ann and their combined love of music he recovered his strength and vigour and when he died he was as optimistic as ever actively involved in the development of iron shipbuilding on Tyneside and as always looking forward to the future.

John Buddle's grave at Benwell in a vault he designed himself had no inscription or monument yet he died a hero and celebrity and thousands of pitmen formed a guard of honour at his funeral. He would have valued their tribute more than anything else in the world, more even than the respect of the great and good who followed his coffin in more than eighty carriages because the pitmen were his people. Their respect was hard earned and the guard of honour was well deserved, because John Buddle's heart was with his men and no matter how rich and famous he became he never forgot their struggle to dig coal out of the bowels of the Earth, a place where life was a fragile as the flame of a candle and could be snuffed out just as easily.

A Day to Remember

John Buddle's funeral was one of the greatest spectacles ever seen in Newcastle. The procession to Benwell started at Wallsend House a few miles to the east of the City in an open rural landscape dotted with colliery villages overlooking the wide expanses of the Tyne estuary. Sixty gentlemen sat down to breakfast in the substantial house next to the colliery while a large crowd gathered outside, and with more people arriving all the time it was not until twelve o'clock that the procession was ready to move off to travel the ten miles or so to Benwell where Buddle was to be buried. The parade was led by fifty men on horseback riding in formation in front of the hearse which was drawn by four immaculate black horses, and followed by nine mourning coaches for family and friends, and thirty seven private carriages. Behind the family and gentry pitmen from Wallsend and other local collieries walked four abreast in a solemn line as a mark of respect for a man they saw as one of their own.

The procession grew as it approached Newcastle, thirty private carriages joined at Eldon square and more at the infirmary so that by the time it reached Benwell there were more than eighty private carriages alone and the procession stretched for more than a mile down the hill along the famous west road which followed the line of the Roman Wall west along the Tyne valley out of Newcastle. Huge numbers of spectators lined the route and converged on the quiet rural village of Benwell for the interment with thousands more pitmen joining the marchers along the way so that Buddle had a guard of honour fit for any King or Roman Emperor on his arrival at Benwell. He was buried in a vault he planned himself in the grounds of the new church of St James built on his land high on the sides of the steep Tyne valley with a panoramic view to the south and west towards Durham and Hexham.

In Newcastle the great bell of St Nicholas's church in the Groat Market tolled all afternoon in his memory and the whole town went into mourning. Nothing like this had happened before on Tyneside in living memory. To mark the occasion a bust of Buddle was exhibited at the Central Exchange and casts of his death mask were sold as souvenirs at one guinea a time, while engravings of a portrait by Thomas Carrick of Buddle wearing his old pit jacket with the tools of his trade by his side were available for ten shillings and six pence and eagerly snapped up by mourners who flocked to the exhibition.

Buddle's pall bearers included the Reverend William Turner, the eminent Unitarian preacher and anti-slavery campaigner, and the influential solicitor Armorer Donkin, both at the centre of Newcastle society, while William Armstrong, founder of the famous Elswick engineering works and John Coutts the iron shipbuilder were also among the many eminent figures from the commerce and industry in the church for the solemn and impressive service read by Reverend Maughan. It was certainly a day to remember. A stranger in town for the day might suppose that Buddle was a heroic general famous for his part in the Napoleonic Wars or a great landowner and a member of the nobility like Lord Durham much loved by his tenants, but in fact he was neither. He was a colliery viewer, an agent who looked after the interests of the rich and powerful landowners who still dominated the coal industry in the North East. Buddle had served his employers well, and their presence in large numbers at his funeral showed he was no ordinary viewer. Buddle was the chairman of the coal trade committee, the public voice of the owners on everything from the regulation of colliery output to child labour and trade unions and he had served them well. At his death he was an important regional and national figure, but if that had been his only claim to fame his funeral would have been a much more subdued and quieter affair. It was the pitmen who made it special.

With hindsight the obvious affection of the pitmen for Buddle seems puzzling. He was after all an implacable opponent of miner's combinations who sent pitmen to prison and evicted them from their homes to break strikes. Thousands of men died in explosions at the collieries he viewed and his reputation has been dogged by modern criticism of his apparent support for child labour in his evidence to Lord Ashley's Committee and the terrible safety record of his pits. Buddle's own writings show that such easy judgements are far from the truth and the pitmen's view of his character was shaped by their personal experience of what he did for them in the pits.

Buddle said he first went down the pit at the age of six and he spent by his own reckoning the largest part of his life underground. This initiated him into the clannish and secretive world of the pitmen who were a race apart, naturally suspicious of strangers and fiercely loyal to each other. Among the pitmen Buddle was a giant, a charismatic leader, fearless and loyal to his men. In another life he might have been a general who led his people from the front, or an explorer leading expeditions into unknown lands, but because of an accident of birth he became a viewer and his battles were fought underground with gas and rock, and he explored dark places where the great treasure of coal lay hidden. In the expansion of mining and the opening of deeper seams that Buddle pioneered in the early Nineteenth Century the terrible slaughter that followed was given the technology of the time unavoidable, he was like a general on the Somme sending his men against machine guns, but unlike the generals Buddle led from the front and faced the same terrible risks as his men.

Buddle did everything he could to keep his men safe and the idea that the safety lamp was in some way to blame for the disasters by giving pitmen a false sense of security peddled by William Martin and others really is a travesty of the truth. In the account of his funeral in the local Newspaper, the Newcastle Courant, Buddle is praised above everything else for his scientific achievements. He brought the issue of safety in the pits out of the closed world of colliery villages into the vibrant intellectual culture of Newcastle and refused to accept the general opinion that nothing could be done about the explosions that blighted the coalfield. As an intelligent rational man he knew if such tragedies were properly investigated then they could be prevented. Reading his accounts of his work at Hebburn, Wallsend, and Jarrow it is clear just how far his commitment to safety went and how much he cared about his men, even if he failed disastrously to stop the slaughter at Jarrow, the most dangerous pit on the Tyne.

Of course the pitmen cared little about scientific experiments or papers given to learned societies in Newcastle. For them, living with violent death only a moment and a flickering candle's flame away every working day of their lives he did something much more important. They knew that whatever happened he would come for them. Reading the accounts in his journals of the terrible disasters at Heaton and Wallsend it is clear he disregarded his own safety to try and save his men. Buddle's loyalty to his men extended beyond death. I know the horror that pitmen have about being abandoned if they die in the pit. They want to be buried in the green grass under the blue sky where their families can mourn and remember them. Reading Buddle's account of bringing the bodies out of Heaton and helping a father search for the body of his lost son after the Wallsend explosion I know he understood how pitmen felt. That's why they turned out for his funeral.

Buddle's grave at Benwell, now almost forgotten like the church which shelters his memorial bust in what is now a rundown suburb of Newcastle, still holds a final surprise after all these years. Buddle was not a religious man, he was a member of the Reverend William Turner's Unitarian congregation at Hanover Square, Newcastle, he lived in Wallsend, and yet he chose to be buried in a Church of England graveyard at Benwell. Soon after his death the story was told that coal was found in his grave, and even today some local people told me his grave was a mine shaft hundreds of feet deep going all the way down to the High Main Seam. Of such stuff are legends made. Buddle was noted for his sense of humour and the grave is his final joke at the expense of the credulous and gullible. The legend is true, he is buried in coal: Benwell is one of the few places on Tyneside where the High Main Seam outcrops at the surface and his vault is dug into the seam. He planned the vault himself and donated the land to the church so that it could be built. Perhaps he is smiling now at the idea that the legend endures even after all these years.

Despite his fearsome reputation in later life as a man not to be crossed Buddle was a sensitive man, a man who enjoyed music and played the violin and later the cello to a very high standard. He never married, but he is buried at Benwell next to the woman he loved, his sister Ann, his lifelong companion and partner at Wallsend House. She died just two years before him and I think the knowledge that they would be together in death just as they were together in life gave them both comfort at the end of their lives.

John Buddle died a very wealthy man. On his death he was said to be worth more than one hundred and fifty thousand pounds, the equivalent of well over ten million pounds today. In his will, written literally on his deathbed the day before he died, he left the majority of his estate to his nephew Robert Thomas Atkinson, the son of his eldest sister Eleanor. He was also careful to leave legacies to his many nieces and nephews and their children, but Robert, his professional colleague and a talented musician who often played with his musical group, was the major beneficiary. Robert Atkinson died in 1845 at the young age of thirty eight and was buried in Buddle's vault at Benwell with his aunt and uncle. His inheritance passed to his son Buddle Atkinson together with John Buddle's personal and professional papers which remained in the Atkinson family until they were donated to the North of England institute of Mining and Mechanical Engineers by Captain Frank Buddle Atkinson. This biography is based on those papers.

A Century of Inventions

In 1778, five years after the birth of his only son who was named after him, John Buddle Senior, a schoolmaster and mathematician turned colliery manager from Kyo, near Lanchester, in County Durham, published a little book. It was in fact a reprint of a book first published in 1655, the Marquis of Worcester's Century of Inventions. The inventions included a perpetual motion machine, a means of making a ship miraculously move against the wind, and a "fire engine" for raising water from the depths of mines. Mr Buddle (S) was of course professionally interested in the "fire engine" and wrote an appendix to the Century of Inventions convincingly arguing that the Marquis of Worcester was the inventor of the steam engine.

In contrast to many of the other "inventions" in the book the principle of the "fire engine" is described in detail, enough detail for Buddle (S) who had studied with Emerson that most practical of Eighteenth Century mathematicians to know that this invention unlike the perpetual motion machine would actually work. Steam engines had been gradually spreading through the Northern Coalfield centred on the Tyne since the invention of the atmospheric engine by Thomas Newcomen in 1710 and their improvement by Henry Beighton of Newcastle in 1718 and Buddle (S) wrote in his forward to the book that the "fire engine" was the prime mover of the coal trade and that nine collieries out of ten could not be wrought without the machine. As a mathematician however he knew that the power of the atmospheric engine was limited: in an atmospheric engine steam produced by a boiler raises a piston in a cylinder, and is then condensed by the introduction of cold water into the cylinder, which creates a partial vacuum, and causes the pressure of the atmosphere to drive down the piston which works a pump via a beam. The force of the atmosphere is limited however, so an atmospheric engine can only lift water a little over thirty feet, not nearly enough for the deepest mines which had to be pumped out by a series of steps in which engines lifted water between different levels less than thirty feet apart.

The Marquis of Worcester's experiments, described in detail in "A Century of Inventions" showed that the real power of steam was unlimited. The Marquis described how he filled old cannon three quarters full of water, securely stopped up all the openings, put it on a fire, and within twenty four hours it burst with a "great crack". The power of steam the Marquis concluded was limited only by the strength of the container used to harness it and his "fire engine" which used the pressure of steam alone to force the water out of a mine was undoubtedly capable of draining pits at unimaginable depths so Buddle (S) concluded that by virtue of being both the first to describe in detail the operation of a "fire engine" and the first to properly understand the true power of steam the Marquis was the inventor of the ffeam engine. In a tone strangely reminiscent of the argument his son later had with George Stephenson over the invention of the safety lamp Buddle (S) discounted the contribution of Newcomen and his associate John Calley in the invention of the steam engine as being neither "philosophers to understand the reasons, or mathematicians enough to calculate the powers, and to proportion the parts, very luckily by accident (they) found what they sought for." Both Buddle's, father and son, were disciples of Emerson and luck played no part in either the Buddle's or Emerson's view of how mathematics and engineering worked.

William Emerson from Hurworth near Darlington in County Durham was a near neighbour of John Buddle (S) and a major influence on his life. Emerson, hailed as a mathematical genius by his contemporaries was the author of a popular textbook *The Principles of Mechanics* (1754) which ran to six editions and a practical man who "never advanced a proposition which he had not previously tested in practice, nor published an invention without first proving its effects by a model". Both Buddle's, father and son, followed Emerson's principles all their working lives and they brought them fame and fortune even if Emerson himself lived in relative obscurity and poverty in a rural cottage on an allowance of eighty pounds a year.

It is unlikely the younger John Buddle ever met Emerson who died in 1782, but if he did the uncouth old man with a dirty wig who always wore an old waistcoat fastened only by the top and bottom buttons, and knew almost as much as Newton about fluxions (calculus), would have made as big an impression on him as he did on his father. Emerson certainly made an impression on Buddle through his father and Emerson's "Principles" was the Bible that Buddle followed all his professional life. The Eighteenth Century was the great age of amateur mathematicians who explored Newton's Principia with all the excitement of explorers on the threshold of a new world. The Buddle home library would have certainly also included a copy of James Ferguson's Astronomy Explained upon Sir Isaac Newton's Principles (1756) which made the Newtonian revolution accessible to a general readership. Ferguson like Emerson, and John Buddle (S) himself was a selftaught practical man whose clear explanations and models illustrating difficult principles of science made his work a best seller. With the increasing wealth of his family young John Buddle probably had a telescope and looked at the night sky not in awe but in wonder because he knew that with Newton's mathematics all the complex motions of the planets could be predicted and that there was nothing beyond the reach of science.

Buddle's (S) jump from the chalk face to the coal face was a massive leap of faith by a man who practiced his mathematics in the real world just as diligently as he practiced it in the classroom. Buddle (S) did not like Emerson retreat from the classroom into solitary contemplation; he went out as an apostle for what he thought was a universal tool applicable to all trades and professions, especially mining. Apart from Emerson Buddle (S) also maintained an academic correspondence with Charles Hutton. Hutton like Buddle (S) shows the extent that social mobility was possible in Newcastle at the end of the Eighteenth Century. Hutton's father was a minor colliery official, possibly a deputy overman, and the young Hutton was marked out for a scholastic life when a childhood injury made him unfit for heavy manual work. Unlike Emerson who found it difficult to come down to the level of his pupils and failed as a schoolmaster, Hutton built a successful career as teacher in Newcastle before moving up to take on the prestigious post of Professor of Mathematics at the Royal Military Academy, Woolwich in 1773.

Hutton's book The Schoolmaster's Guide, or a Complete System of Practical Arithmetic' published in 1764 would certainly have formed part of young Buddle's education, as would Hutton's other massive work A Treatise on Mensuration, Both in Theory and Practice which was distributed to 1000 subscribers and illustrated with a wood block print by Thomas Bewick, his first published work. Young Buddle was educated at home by his father and famously said he first went down the pit when he was six, but notwithstanding that early introduction to work he placed great value on formal education, and towards the end of his life collaborated in the establishment of the first academic course in Mining at Durham University and was the external examiner for the first students.

Much to the confusion of present day readers Buddle published a reprint of his father's book in 1813, seven years after his father's death, which sold more copies than the original and is often thought to be his work. By that time Buddle understood even more than his father what the Marquis of Worcester meant when he said that the power of steam was unlimited. Buddle would have said useable power of steam was limited only by the strength of the materials used to capture it. By then high pressure "Trevithick" engines, named after the Cornish inventor and engineer, were using steam pressure rather than atmospheric pressure to pump out northern pits, and Buddle's calculations in his diaries show him at his best as a manager, mathematician and a practical engineer writing detailed specifications for engines for the many pits he viewed (acted as a consultant to).

Given both Buddle's, father and son, practical outlook it is likely that they repeated the Marquis's dangerous experiment, if only as entertainment for young Buddle in his home schooling. Buddle's (S) experiment would certainly have been more detailed and precise than the Marquis's. He would have wanted to know given the strength of the material what pressure of steam would be required to burst the container, and how much coal, and how much water would be consumed. John Buddle certainly performed such calculations when he was designing steam engines for mines and when he worked with William Chapman on the development of the pioneer steam locomotive now universally known as the "Steam Elephant" after its replica at Beamish Museum. Young Buddle can only have learned such things from his father who was his only teacher, he never went to school.

Judging by the evidence of his son Buddle (S) was an inspirational teacher. The younger Buddle was an eager explorer of books and papers, always searching for knowledge, interested in everything, a quality he never lost, and his father gave him a rigorous and comprehensive education in all branches of learning, from music to mathematics and literature to Latin including naturally mining. Buddle's earliest surviving notebook dating from 1796 is a collection of notes on scientific and technical topics meticulously copied from an advanced text book. Buddle had been his father's assistant since the family moved to Wallsend in 1792 when young Buddle was just nineteen and the notebook reflects the fact that even at twenty three he was still his father's student. The book contains notes on mechanics, the principles of bevel gears, friction, a description of the operation of a pump, and details of Watts improved steam engine. Its contents reflect the needs of an intelligent young man still feeling his way in the practical world of work, it is a handy pocked size book which could be carried around and used as a source of reference in the pits. Buddle had his father's ability with mathematics and he relished problems that could be solved by calculation. Some of the pages of his colliery journals look like questions from a long forgotten mathematics examination set for students at the sort of technical school I attended in my youth:

Wallsend Colliery Journal Wednesday 6th December 1809.

At Brancespeth with Major Russell where it was fixed to cut the lower set Bunton Hole, for an additional engine, on the B pit as soon as may be. The intended engine must be of sufficient power to lift an 18 inch or 20 inch set of pumps. The depth of the pit to the bottom of the sump is 106 fathoms, off take to Tyne level 10 fathoms net lift of water 96 fathoms.

Now supposing an 18 inch set of pumps to be used it must be divided into 4 lifts of 24 fathoms each and as far as water in an 18 inch bore weighs 662.8 lbs the whole column will weigh 662.8x96= 81628.8 lbs.

Now supposing a double powered cylinder to work with a power of 8 lbs per square inch upwards and downwards the diameter of the cylinder required will be as below.

Let L equal the diameter of the cylinder required then L.7854x16=81628.8

But adding one and a half pounds a square inch upwards and downwards for the leverage of the beam viz. 3.4 the diameter of the cylinder will be .7854x19 = 81628.8 and L = $\sqrt{81628.8}/14.9226$

= 74 inches nearly but this is too large a cylinder to be used.

A double powered 63 inch cylinder will lift a 17.25 inch pump 96 fathoms. (Buddle, WJ)

Whether Buddle explained his calculations to Major Russell and what Major Russell thought of them he doesn't say, but the engine was bought. They were certainly set out in a way his father would have approved. A new engine could cost more than two thousand pounds and Buddle was always careful to make sure it was up to the job and would save money in the long run. Wallsend Colliery Journal Wednesday 9th August 1812.

Supposing a 7inch working bore a 100 fathom 7inch column of water will weigh 10023lbs

Cylinder 39 inches diameter 39x39x.78549=1194.4 (this is the equivalent of the modern formula for the area of a circle) Steam pressure 7lbs gives 8362.2

Stroke to be 8 feet and cylinder 6inches in pit gives 6/66897.6, Power in shaft11149.64, Weight of column 10023 so 1126.6 to spare at 7lbs inch. (Buddle, WJ)

Buddle, first at his father's insistence, and later because it became central to managing his busy professional life, kept detailed and meticulous record of everything he did with everything carefully indexed for future reference. There are of course many routine calculations of everything from the amount of hay and oats needed for horses, the volume of coal in a seam of known area, and the saving of using ponies to pull corfs on rollies as against horses or men with barrows, but there are also notes of anything interesting and unusual, a balloon seen a Jarrow and a sketch of a fossilised tree found in the coal seam. The secret of his success was that these records, so valuable to historians now, allowed him to compare and contrast the working of different Collieries and formulate detailed plans for each based on proven methods.

Sometimes the results were not what we might have expected with hindsight: at Jarrow and Hebburn he found that men were more economical

than horses in the old workings so parts of the collieries went back to what seems a primitive system of man hauling, but for Buddle it was all a question of what was the most efficient. Before it collapsed in the middle of the Nineteenth Century the Coal Trade was controlled by a cartel which regulated the production of coal rather like OPEC regulates the production of oil now to maintain prices in the interests of producers. Such a system could have led to stagnation and inefficiency, but Buddle increased owner's profits by exploiting reserves in a controlled way, getting more coal out of the ground from old workings, and reducing costs through the introduction of improved transport, tramways and stationary engines, underground. Buddle would have done well in business in any age, but in the early Nineteenth Century his effective management of the complex mix of old and new technology in mining made him by the end of his life a dominant figure in the industry and a very wealthy man.

Buddle is often called the first mining engineer, but his interests went much wider than mining, which is surely a tribute to the education he had from his father. His diaries are full of observations about science and natural history and his obituary in the Newcastle Courant said pointedly he was the first person to apply science to mining. After 1810 Buddle became deeply interested in the development of the steam locomotive, later he was a pioneer of Geology and provided specimens to illustrate the standard work "The Fossil Flora of Great Britain" by Lindley and Hutton, and at the end of his life he facilitated the introduction of iron shipbuilding to Tyneside. He was at the centre of intellectual life in Newcastle for more than thirty years as a founder member of the Literary and Philosophical Society and the Natural History Society and he was a prime mover in bringing the British Association to Newcastle in 1838.

As well as a scientist and engineer he was an accomplished musician, he played the violin and later the cello to a very high standard and when he lived at Wallsend House it was the venue for regular musical evenings in which Buddle played in a quartet and entertained members of his wide circle of friends which included the great and the good from all parts of Newcastle society. Buddle was also fond of the theatre and was chairman of the proprietors of the new Theatre Royal in Newcastle (he designed the heating system). He was a man of all talents, a Renaissance man, at a time when it was still possible to reach out and grasp all knowledge, an educated man who never went to school or university, but who sought knowledge all his life and that more than anything else is the key to his character.

Newcastle's Call

Newcastle's Call to her Neighbor and Sister Towns and Cities throughout the Land, to take warning by her Sins and Sorrows is the first book written about Newcastle, even if it was not written in Newcastle. It deals with the Great Plague of 1636 which killed 5,552 people, more than half the town's population, in just a single summer. The book was written by Dr Robert Jenison, a leading nonconformist clergyman from the town, in London after he fled the plague and deserted his flock to save himself. Dr Jenison was in no doubt what caused the plague, it was the wrath of God, a judgment on the Godless people of Newcastle, the new Babylon in the North of England. Newcastle in the Seventeenth Century was a boom town, the "black indies", a place where people could get rich quick, a place where the old order meant little, all because of coal. John Buddle was a Newcastle man, and his Newcastle cannot be understood without a quick look back at its history.

Newcastle coal warmed the hearths of Pepy's London and in the Seventeenth Century there was an Industrial Revolution in Newcastle which had almost as great an impact on the town and its people as the later Industrial Revolution built on the same foundations of Coal, Iron, and Railways. The earliest railway map in the world is a map of Benwell a few miles to the west of Newcastle showing a waggonway running down to the river from the coal mines. Tyneside's coal industry began at Benwell because here the coal seams outcropped at the surface on the slopes of the deep Tyne Valley convenient for both mining and transportation. Coal had been mined at Benwell since Roman Times and coal from the High Main Seam which was easily accessible from river heated all the forts of the eastern part of the wall that could be conveniently supplied by water. The garrison at Arbeia (South Shields) in the fourth century was the Tigris Lighter men, sailors from Iraq, perhaps the predecessors of the famous Tyne keelmen.

By the Seventeenth Century the High Main Seam had been worked out and London's demand for coal was growing, so new mines were sunk and new seams found which were deeper and more difficult than any ever attempted before. The first published history of Newcastle, William Gray's wonderful *Chorographia* written in 1649, essentially a lament on the fall of the town to the Scots in 1644, gives a tantalising glimpse of the almost unknown economic history of that time:

"Mr Beaumont, a gentleman of great ingenuity and rare parts, adventured into our mines, with his thirty thousand pounds, who brought with him many rare engines, not known then in these parts; as the art to borre with iron rodds, to try the deepnesse and thicknesse of the coale; rare engines to draw water out of pits; waggons with one horse to carry down coales from the pits to the stathes, to the river, &c." (Gray, 86)

Mr Beaumont is remembered at Benwell in the Beaumont seam which he discovered, and despite John Buddle (S) advocacy of the Marquis of Worcester as the inventor of the steam engine it is possible Mr Beaumont has a prior claim. By the middle of the Seventeenth Century pits at Benwell were
working the Low Main Seam under the river with the assistance of "fire engines". One near the village of Paradise broke into a gully in the river bed, flooded, and collapsed causing a great crater in the river bed which was still visible in the early Nineteenth Century together with the wall built around it to save the pit. The drowned pit was drained and the collieries under the river continued to expand suggesting that these early miners had something more powerful than horse gins to drain their pits. The detailed description of the "fire engine" in *A Century of Inventions* which is in sharp contrast to the lack of detail in most of the other "inventions" suggests that the Marquis knew of such a machine and had seen it work as based on his other "inventions" he was more of a collector of ideas and stories than an inventor.

Robert Jenison wasn't interested in coal, but the success of the coal trade was the source of Newcastle's wealth and its growing reputation as the new Babylon; a device for the public humiliation of drunkards, a barrel in which the unfortunate victims were confined with their head out the top and their arms through the sides, was called a Newcastle Cloak. Dr Jenison would certainly have regarded the fire in the High Main Seam at the end of the Seventeenth Century, a subterranean volcano which burned for thirty years, as a further sign of God's wrath, but despite its reputation the coal trade grew and prospered in the Eighteenth Century whatever god might have thought. Newcomen engines were widespread by 1750 as Buddle's (S) appendix to "A Century of Inventions" notes and Mr Beaumont's innovations for exploring for coal with borings and transporting it to the river on waggonways were universally adopted along the river. Gray records that Mr Beaumont lost his £30,000 and returned home with just one horse, but others came and made their fortunes as Newcastle continued to attract people of ability and ambition like Buddle (S) eager to make their fortune.

At the time of John Buddle's birth Newcastle was still recognisably the medieval frontier town with its castle and city walls although it had long outgrown its boundaries and origins as a fortress against the Scots. To the west at Benwell there were the large mansions of the rich who had made their money from coal, while to the east and along the riverside there were the tenements of the poor crowded together on the steep slopes of the Tyne Valley and along the Ouseburn. Newcastle's growing wealth brought the poor as well as the rich to the town and they packed into every available space even living in the Castle Keep, the Black Gate and the towers of the town wall. Newcastle was chaotic, dirty, and dangerous, but it had aspirations and within John Buddle's lifetime it was rebuilt into the elegant city we know today with its classical architecture symbolised by the majestic sweep of Grey Street shouting out this is an important place.

Newcastle had a lot to live down even on Tyneside. Ralph Gardner's book England's grievance discovered, in relation to the coal trade; with the map of the river of Tine, and situation of the town and corporation of Newcastle: the tyrannical oppression of those magistrates, their charters and grants; the several tryals, depositions, and judgements obtained against them; with a breviate of several statutes proving repugnant to their actings; with proposals for reducing the excessive rates of coals for the future; and the rise of their grants appearing in this book published in 1655 but still in print throughout the Eighteenth Century condemned the Newcastle Corporation and Hostmen (Merchant's) for their corrupt monopoly of the coal trade and added the execution of innocent women for witchcraft and much more besides to their many crimes for good measure. All Saints Church above the guayside was the standard bearer for Newcastle's hopes to move on from its past. By the middle of the Eighteenth Century the historic All Hallows Church, the church of Newcastle Merchants like Richard Thornton whose magnificent brass memorial which once graced All Hallows is now in St Nicholas's Cathedral, was crumbling. With a confidence in the future and a lack of regard for the past which has been characteristic of Newcastle's attitude to its historic buildings ever since All Hallows was demolished and replaced by the new All Saints Church. All Saints was like nothing ever seen before in Newcastle and with its classical detailing and elliptical shape it announced to the world that Newcastle had arrived as a place of art and learning as well as new money.

Within a generation of the building of All Saints most of old Newcastle was swept away leaving only fragments for us to glimpse today. The famous trio of Dobson, Grainger, and Clayton rebuilt the City Centre in an elegant classical style and the railway swept through the old Castle separating the Keep from the Black Gate and leaving it marooned like a signal box at the railway junction. To catch the spirit of Victorian Newcastle walk down Grey Street which was completed in 1839 and admire the confidence and grandeur of Dobson's architecture and Grainger's vision of a unified style for the city unrivalled anywhere it Britain. Grey Street says that there is more to Newcastle than the coal which had made it famous and notorious for more than two hundred years, it shouts that this is the city of the future, a place of culture and industry where anything is possible.

In the Nineteenth Century Newcastle changed the world. Railways which were invented in Newcastle spanned the globe. The steam turbine which was invented in Newcastle shrunk oceans and lit the world with electricity. Newcastle was the first City in the world to be lit by electric lights. If one event could stand for that era it would be William Armstrong's lecture to the Newcastle Literary and Philosophical Society on Hydro Electricity in 1844. The Society founded in 1793 was as much a symbol of Newcastle's aspirations as All Saints Church and Grey Street. In the Nineteenth Century George Stephenson demonstrated safety lamp and Joseph Swan demonstrated his electric light bulb in the Societies lecture hall as the Society became a focus for science and innovation.

In 1844 Armstrong was still a solicitor, a partner in the firm of Donkin and Armstrong, but he had a passionate interest in science and was highly regarded as a gifted amateur who was an inspiring speaker. His hydroelectric machine was a device for generating static electricity from the discharge of steam from a boiler and his lecture was a sensation. The event was a sell out and people without tickets climbed in through the windows to see the spectacle. I would have loved to have been there to see the excitement and enthusiasm which captured the spirit of the age. John Buddle died in 1843, he was one of the eleven survivors of the original seventy members of the Society who attended its fiftieth anniversary dinner on the Sixth February 1843, but Armstrong, who was one of the executors of Buddle's will, and the partner of his close associate Armorer Donkin, demonstrated the machine to Buddle at his house in Jesmond Dene well before the lecture and Buddle as an important man got an exclusive preview of the show.

Saturday 15th July 1843. Attended a meeting of the Executive Committee at 2 o'clock and dined with Mr William Armstrong at Jesmond. After dinner Mr Armstrong exhibited his large steam electric machine. This is probably the most powerful electric apparatus ever made. The steam is generated in a high pressure cylindrical boiler; the steam is at 50 pounds per square inch. The electricity is created by the steam issuing from a range of small pipes fixed on one side of the boiler near its upper side; the orifices of those pipes are of a peculiar constriction, to increase the friction of the steam as it issues from them. The quantity of electricity generated by this apparatus is truly extraordinary; it charged and exploded a large Laydon jar nearly 200 times in a minute. Captain lbbotson has been spending some time with Mr Armstrong experimenting with this apparatus and has obtained some new chemical results from it, in the decomposition of certain substances which had never before been effected by electricity. (Buddle, PB)

Buddle and Armstrong had a similar outlook, a curiosity about everything, a desire to know, and a love of practical experiments. It was the spirit of Newcastle and it made Newcastle great. The hydroelectric effect had been first observed at Cramlington Colliery in 1840 by William Patterson and Armstrong's investigations into the phenomena, perhaps prompted by Buddle who was the viewer of the colliery, led to the development of the machine; the most powerful generator of its day capable of producing sparks twenty feet long like the lightening in John Martin's epic pictures and a crack which warned of doomsday. It had the same effect on Armstrong as the cannon experiment had on the Marquis of Worcester two hundred years earlier, he knew he had seen one of the fundamental forces of nature at work, and it is no coincidence that Newcastle became a centre of electrical engineering at the end of the beginning of the Twentieth Century.

Charles Parson's, inventor of the steam turbine, was apprenticed by his father at Armstrong's Works to learn about engineering and William Armstrong went on to find fame and fortune through armaments and is remembered today for his great engineering works at Elswick, supplier of weapons to the world, but in a memorial lecture for the hundredth anniversary of the Literary and Philosophical Society in 1893 he confessed that the hydroelectric machine was still his first love. Like Buddle, and Charles Parsons who built turbines and telescopes and searched for a way to make artificial diamonds he was at heart a scientist. That was the spirit of Newcastle epitomised by the Literary and Philosophical Society which made the city for a time the centre of the world and the Tyne the Silicon Valley of the Industrial Revolution where the future was made.

The final endorsement of Newcastle's status was the meeting of the British Association for the Advancement of Science in Newcastle in 1838. The Association had been founded in 1831 and before Newcastle meetings were held in York, Oxford, Cambridge, Edinburgh, Bristol and Plymouth. Hosting the annual meeting depended very much on having an active local group. Newcastle's was based on the Natural History Society founded in 1829 as an offshoot of the Literary and Philosophical Society with John Buddle as a founder and committee member. Buddle used the Natural Society as a stage to present his papers on the causes of explosions at Jarrow and Wallsend and the geology of the coal measures at Benwell. He was present at the 1836 meeting in Bristol, and actively promoted the cause of Newcastle as a future venue for this important event.

Buddle greatly valued the contacts he made through the Association and was enthusiastic about the annual meeting coming to Newcastle. He was on the organising committee and managed to smooth over an embarrassing political problem when the post of President was offered to both the Duke of Northumberland and Lord Durham. The Newcastle Committee approached Lord Durham, but found to their horror that the post had been offered by the Association to the Duke three months earlier without their knowledge. Buddle had been the Lambton colliery agent since 1806 and knew Lord Durham well so it fell to him to explain the embarrassing mistake to his lordship at a dinner at Lambton, it must have been an uneasy meal, but the Association absolved the Newcastle committee of all blame and the matter was settled amicably. Buddle presented a paper to the meeting on the Geology of the Northern Coalfield which was well received and marked the culmination of his efforts to bring mining out of the dark and into the halls of academia. Mining at last was a science and Newcastle had its day in the sun. It was well deserved and in future Newcastle could not be ignored and the Association came back in 1863 and 1889 as the town grew in reputation and prospered.

During the meeting Buddle had a number of eminent guests at Wallsend including the eminent mathematician Charles Babbage. At the time Buddle was preoccupied with dealing with a burst dam at Percy Main Colliery and found it hard to conceal his amusement that his distinguished guest found the construction of the dam so difficult to understand:

> <u>Sunday 2nd September 1838.</u> Messrs Babbage and Greenburgh spent the day with me. Mr Babbage puzzled himself about the construction of the Percy Dam without success. (Buddle, PB)

Buddle in his diaries was no respecter of authority even if he was publically deferential to Lord Londonderry and the nobility, but he certainly respected achievement and in Newcastle then it was achievement that mattered.

The Steam Elephant

As a Geordie I am proud of coming from Newcastle and I am proud of the ingenuity and inventiveness of the people of Tyneside. My father used to tell me that when he worked at Parson's during the war they got a message from London containing a long and complex specification for some part that had to be made especially for a secret project. Attached to the specification was a handwritten note, it said "Can you make this?" The companies reply was simple and to the point: "In Newcastle we can make anything!" At the beginning of the Nineteenth Century this was the view of people like John Buddle and that is why the first steam locomotives were made here. The steam locomotive, a machine of elegance and power, in my mind the most beautiful machine ever made is a product of Tyneside and it is our gift to the world. Even though the technology is now obsolete it still has lots of admirers and will be remembered I think for as long as people are interested in machines. John Buddle, an enthusiast about the power of steam since he learned about the Marquis of Worcester's experiments, was deeply interested in the locomotives although his actual contribution to this like everything else is somewhat obscured by his method of working in collaboration with others and his reluctance to claim any credit for himself for anything.

Buddle's earliest diary, a record of his work at Benwell Colliery which begins in 1801 tells the story of how he built a waggonway from his pits on top of Benwell hill down the side of the steep Tyne Valley to the staithes on the river. Waggonways were not new in Benwell, a Seventeenth Century map showed waggonways running down to the River even then, and it is likely the Roman's had something like a waggonway running down to the river from the fort on the top of the hill here more than a thousand years earlier. One of the enduring legends of Tyneside is that the strange gauge of four foot eight and a half inches here had its origins in the distance between the wheels of Roman Waggons whose axels were five feet long. The Roman Waggonway would have been a flagged road with stone tracks that guided the wheels of carts down the hill, rather like the tracks that can still be seen today on the rocky foreshore of Robin Hood's Bay in Yorkshire which guided carts to waiting ships. Mr Beaumont's waggonway described by Gray and shown on Seventeenth Century maps would have had wooden tracks that guided the unflanged wheels of carts which ran down the hill by gravity and were pulled back up by a single horse.

John Buddle's waggonway was different; it had iron rails and trains of waggons were worked by gravity so that loaded waggons going down the hill pulled trains of empty waggons back up. The system wouldn't work on the old wooden waggonways, or the iron plate ways which replaced them, it needed cast iron rails and those rails were the origin of modern railways. For Buddle the advantages of self-acting inclines, straight lengths of track where waggons went up and down connected by ropes round a drum, were obvious. Transport, particularly horses, was the most expensive item in any colliery, the incline more than halved the number of horses used above ground at Benwell and saved its capital cost in just one year.

The Benwell Waggonway was completed in 1809 and was in use for almost thirty years. It was abandoned when Benwell Colliery started supplying the growing local market instead of sending coal to London, and the line which went through what is now St James Churchyard was cut when the Church was built in 1837. Early Waggonways had little in the way of Civil engineering works, but the Benwell Waggonway had a substantial bridge under Benwell lane and the cutting for the inclined plane which had to be straight with a uniform gradient was still marked on the Ordinance Survey maps of the area in the 1860's more than thirty years after it was abandoned. The line of the lower part of Atkinson Road now still follows the course of the Waggonway which was still a feature of the landscape when the road was built.

It is worth looking at Buddle's account of the building of the Waggonway in detail as a unique account of the building of an early railway. Buddle was more than just a mining engineer and in his lifetime he surveyed the route of a number of railways, notably the Leamside Line through County Durham which completed the first direct route from Newcastle to London over the majestic Victoria Bridge across the Wear at Fatfield A working example of a railway with a rope worked incline can still be seen at the Bowes Railway in Gateshead which is well worth a visit. November 22nd 1808. Examined the line of the intended new waggonway from the sinking pit to the head of the inclined plane at the Charlotte pit: From this examination it appears to me that it will be the best plan to bring the way due e from the new pit in the first place as far as the east side of the stack yard at the Quakers House where it will gain the summit level of the hill, and then on a southern direction to the brow of the hill on the south side of the turnpike from whence an inclined plane (provided the fall is sufficient) will join it to the Charlotte pit branch. (Buddle, BJ)

<u>February 27th 1809.</u> Levelled from the top of the hill in the front of Andrew Oliver's house and ground the fall to the Charlotte pit to be 88 yards and the distance 368.06 yards. The fall is therefore 1 in 12 and is sufficient I think for a descending plane, for the full wagons to draw up the empty ones. (Buddle, BJ)

<u>September 12th 1809.</u> Begun to lay the cast iron waggonway to the Edward pit, started at the bottom of the inclined plane near the Charlotte pit (Buddle, BJ)

<u>September 18th 1809.</u> Begun to lay the iron way from the Edward pit, started at the branches (Buddle, BJ)

November 7th 1809. Weight of 6 waggonway rails 164 lbs so 27.33 lbs each rail. Weight of 6 pedestals 47 lbs so 7.83 lbs each pedestal. Then 1 yard of rail is 70.32 lbs. Cost of rail 5s 10.5d, cost of pedestal 1s 9d. 70.5 lbs at 12s6d is 7s10d. (Buddle, BJ)

<u>December 19th 1809.</u> Length of the new inclined plane from head to join the Charlotte pit plane 247.5 fathoms (495 yards). Ordered the rope of Messrs. Hood and Co. for the plane 250 fathoms 3.5 inches, the waggonway will be completed in a few days when the rollers must be fixed. (Buddle, BJ)

<u>May 8th 1810.</u> The labouring down plane from the top of the hill is answering very well. The wagons will descend low enough to join the head of the Charlotte plane. None of the cast iron rails upon the plane have broken with the weight of the laden wagon. It would be very advantageous to lay the bye way from the staith to the bottom of the Charlotte pit plane with cast iron. (Buddle, BJ)

<u>August 8th 1810.</u> Supposing the waggonway from the intended new pit to be joined to the Delaval Way it will require along the bottom of the hill 550 yards, inclined plane 704 yards, total 1254 yards. But supposing the branch from the intended new pit to be joined to be joined to the Charlotte pit branch near the bridge in Benwell lane it will require 1364 yards of way. Should the latter line of way be found eligible, the Charlotte pit inclined plain and machinery may be made to answer the purpose and will serve all the pits. (Buddle, BJ) Benwell like most of Tyneside was not good locomotive territory. The steep slopes from the pits down to the river were beyond the capacity of any locomotive to climb, although one design attempted to solve the problem with legs worked by steam which pushed the engine and its waggons up the hill, a real iron horse. Buddle's incline was a typically practical solution to the problem of how to reduce the cost of expensive horses on colliery waggonways and deal with the steep slopes of the Tyne valley. Near Benwell a waggonway ran along the banks of the Tyne from the Colliery at Wylam and it was here that the real history of the steam locomotive as a working machine not a technical curiosity begins. The Wylam waggon way was level and by 1813 William Hedley's locomotives were hauling coal from the pit to the staithes on the river.

Hedley's locomotives were beam engines on wheels and at first they worked on simple wooden track which often broke, and later plateways which were stronger, but still nothing like modern rails. The locomotives originally had eight wheels to reduce the load on the track, and it was not until 1830 when the Wylam Waggonway was modernised with castle iron rails of the type Buddle used at Benwell that they were rebuilt with four wheels in the style seen today in the replica "Puffing Billy" which is a familiar sight at Beamish Museum. Hedley showed in experiments that locomotives with smooth wheels could run on iron track and first demonstrated the principal of modern railways which made the haulage of great loads over long distances possible but it is doubtful if anyone, Hedley or Buddle could have imagined the transport revolution that was beginning when the first locomotives ran at Wylam.

Hedley's locomotives worked because they were low powered, relatively heavy, and ran on level track so they avoided the problem of wheel slippage which plagued early locomotives. Buddle understood the delicate balance between weight, and power which is the key to a successful locomotive and his papers contain detailed calculations of the tractive effort of locomotives based on weight and friction, principles which he studied with his father and copied in his notebook in 1796. Hedley's locomotives were useless at Benwell where the waggonways ran steeply down to the river so in 1813 Buddle commissioned his friend and associate William Chapman, a former viewer of Wallsend Colliery, to design and build a new type of locomotive. Chapman's notes describing the machine still exist in Buddle's papers in the Mining Institute in Newcastle written as a commentary to the original plans submitted to Buddle for approval which are now lost.

The "Steam Elephant" which is well known now from the replica at Beamish Museum was lost in obscurity for many years, but deserves to be recognised as a pioneering locomotive in its own right. Buddle paid for the construction and it was built to his specification which demanded a level of performance that was far beyond Hedley's simple machines. Chapman's idea, that the locomotive would pull itself along on a chain, and so be able to tackle any gradient, was unfortunately not economically viable, stationary engines were better in every respect. The "Steam Elephant" was in its day though the most powerful locomotive in the world and contained a number of novel features to meet Buddle's demanding requirements for a locomotive that steamed better and was more powerful than any previously built and it is that rather than the chain drive which makes the "Steam Elephant" significant.

The Elephant's characteristic tall chimney produced a powerful draught which made it a good steamer. The cylinders were embedded in the top of the boiler, keeping them hot and reducing the problem of the condensation of steam which could crack cylinder castings and wasted energy, and uniquely a water tank round the base of the funnel heated the water before it entered the boiler which reduced the time the boiler took to raise steam and increased its efficiency. Elements of the Steam Elephant's design can be seen in later locomotives like Stephenson's Locomotion Number One built for the Stockton and Darlington Railway in 1825 and the Elephant was a model for colliery locomotives long after Stephenson's Rocket, the first modern steam locomotive was built in 1832. The "Steam Elephant" with Chapman's chain drive removed was still working at Eppleton colliery in 1834 and the Hetton Colliery locomotive now at Beamish Museum, thought at first to have been built by Stephenson in 1822, but now believed to have been made much later, possibly as late as 1850, shows the endurance of some of the elements of Chapman and Buddle's original design.

Locomotives like the "Steam Elephant" and it successors built in local colliery workshops, were obscure and unremarkable. The Elephant could have been lost from history but for a picture discovered by Beamish Museum and a fleeting reference to the Steam Elephants in the coalfield starving if the coal ran out which might suggest they were once a common sight in the coalfield where geography was suitable after cast iron rails had been introduced. Buddle was a pioneer in steam haulage in a way which is often forgotten with the concentration on the history of railway locomotives: he introduced cast iron rails and stationary engines underground into his collieries which revolutionised mining and allowed hewers to work further from the shaft and overcome faults which meant coal had to be hauled up inclines to the shaft rather than along level roads, something which is discussed in more detail in a later chapter of this book.

> <u>April 28th 1802.</u> The workings of the Charlotte pit are principally to the S East of the shaft in the Stumple Wood, they are going both east and west from the south winning headways. The east boards are cutting off at the rate of two boards every pillar, against the Elswick Boundary, and the west boards are limited by the even on the north winning headways, upon the whole there will be coal in this quarter to supply the pits workings for eighteen months or two years. The even on the north winning headways have been advanced about 21 winnings and will probably have to go 70 or more further, the coal along the

whole extent of the headways, so far as they are advanced is very good and somewhat harder than the general run of the seam. The seam in these headways is 3 feet 5 inches thick and the board so thin as to be only like a lasting. From the gradual and regular rise of the headways the situation will be excellent for the application of a cast iron railway which must be introduced as soon as it becomes necessary to work coal in that part of the pit. (Buddle, BJ)

The history of the steam locomotive illustrates more than anything else Buddle's view of the nature of invention. Travelling locomotives had been possible for a number of years before they first made an appearance on Tyneside soon after 1810. The widespread use of steam engines in the coalfield for pumping and winding turned ordinary men like Stephenson into engineers allowed them to express their skill and ingenuity by improving their machines. I remember my uncle who spent his life working on locomotives in a steelworks, when a part wore out he drew it, cast it, machined it, and replaced it, so by the Nineteen Sixties there was little or nothing of the original locomotive left, they were really new builds and that's how the early engineers worked making improvements along the way when they thought they could do better.

What held them back was economics. Few people had the patience or money for experiments without a specific purpose. The economics of Buddle's Benwell Waggonway were obvious, it was a costly undertaking at nearly eight shillings a yard for track alone (more than £500 for just a single line) but with its cast iron rails and self-acting inclines it replaced 26 horses which represented £624 capital alone, not including the cost of caring and feeding for them. The economics of the Steam Elephant which cost about the same to build as the incline were not so clear; it saved the horses, but needed about the same again spent on improving the track and used large amounts of coal. The incline did more for less and that for Buddle was what the application of technology was all about. It was only later when historians like Samuel Smiles looking for heroes, inventors who changed the world, wrote biographies of engineers that the idea of the lone genius was born. The story of Stephenson wasn't like that, he had a powerful sponsor in Nicholas Wood who like Buddle took a wider view of innovation as a cooperative enterprise and helped Stephenson formulate his ideas.

Chapman patented the design of the bogies in the original Steam Elephant which were regarded as unnecessary in the final six wheeled locomotive running on sturdy cast iron track. The design was the forerunner of the bogies which are now ubiquitous in railways around the world and something which Chapman deserves to be remembered for. Incidentally the enmity between Buddle and George Stephenson which stemmed from the dispute over the safety lamp is often exaggerated; Buddle's papers show that he was invited to Stephenson's works to discuss designs for the suspension of wagons and he certainly had no problem collaborating with Stephenson or anyone else on the solution of engineering problems. Benwell was John Buddle's first venture away from the overpowering presence of his father. His investment in Benwell was long and successful as he built up his holding with the help of his close friend and business associate the solicitor Armorer Donkin. Donkin is best known as the partner of William Armstrong the famous industrialist who started his working life in Donkin's practice, but the portly solicitor's long association with Buddle was far more important to his rise to eminence in Newcastle society.

From the start Buddle was the managing owner of Benwell Colliery taking special interest in the development of the pit and all underground matters, an arrangement he formalised in a memorandum to the new under viewer (Buddle kept the overall responsibility as viewer, that is manager of the colliery for himself) who was appointed in October 1808 on the resignation of Mr Jopling the previous viewer. In the memorandum Buddle outlines in great detail the present state and future prospects of the colliery so that there should be no disappointments about profits which could not be realised, probably for the benefit of his fellow owners as well as the new viewer.

Benwell was a modest colliery with a Vend of 25,000 chaldrons and two pits, the Delaval pit close to the river and the Charlotte pit at the top of Benwell hill. These were both single shafts with no connection between them underground. In 1804 the colliery made £6,619 profit but the return fell steadily to £2648 in 1807 and for the coming years Buddle thought it would barely break even. Heavy expenditure on the sinking of a new shaft, the Edward pit on the top of the hill was essential to secure the future of the colliery, and the poor state of the Delaval pit where the coal was heavily faulted and confined between two dykes steadily eroded the profits, but Buddle had a clear plan for the future of the colliery and his fellow owners backed his judgement. He thought coal at the Charlotte pit last for two more years, but that it would be necessary to sink another shaft (this was later called the Beaumont pit) to secure the future of the colliery beyond that so profitability was likely to be low for a number of years to come, although the long term prospects were good. The Delaval pit he told the new underviewer should be abandoned as soon as possible to save the unnecessary expense of pumping out the water which seeped in steadily from the river. The memorandum left no room for doubt about who was in charge and how the Colliery should be worked.

Benwell was a model for Buddle's approach to all his collieries, he had a well thought out plan and kept detailed records. By the standards of the day Benwell was a safe pit. Buddle's journals, albeit incomplete, record no fatalities at the Colliery for the period 1801 to 1811. In 1810 the pit bound 157 men and it is likely there would have been accidents where men fell in the shaft or were crushed under falls of stone, Buddle recorded all such incidents in great detail in his later journals, but at Benwell the records are incomplete and the number of deaths is unknown. The danger at Benwell, as it had been since the Seventeenth Century when an early pit under the river flooded, was water. There was a very large feeder (spring) of water in the Delaval Pit which occupied a lot of his time.

January 31st 1809. The feeders of water have increased so alarmingly in the Delaval pit that it seems to me imprudent to continue the workings any longer in that direction, until it is ascertained whether they proceed from a permanent source or not. I therefore ordered the men to be removed to the low coal way as soon as possible. (Buddle, BJ)

The permanent source he was worried about was the river! The stories of the men were not encouraging as local tradition told of an incident where the pit had broken through into a gully under the river bed many years ago with disastrous results.

> Mr Ch. Bedlington's information respecting the old engine pit: This pit was sunk to within 9 fathoms of the Beaumont seam when a large feeder of water was met with. This feeder was supposed to come from the Tyne as at low water the engine with a 22.5 inch pump could strike the water down but at high water the engine was completely beaten. (Buddle, BJ)

Buddle however could not let the matter rest as until the new pit entered production he needed the Delaval coal.

<u>Tuesday 7th November 1809.</u> Down the Delaval pit where the feeders of water in the W way are materially diminished which I attribute to the stemming of the bore hole. The coal in the

middle way is exceedingly irregular being nine feet thick in some of the boards and only 2.5 inches in others. It is of delicate quality although it does not look well. As this way is of limited extent being between two dykes and cannot supply the workings long the west way must therefore be prepared for work again. (Buddle, BJ)

The journal does not record any more problems with the feeder and Buddle's judgement that its source was not the river proved correct. He was to have a much greater problem with water later in his career at Heaton and long after Buddle's death water from the abandoned workings of his Beaumont pit was the cause of the Montagu pit disaster in 1925 something which by Buddle's standards could and should have been prevented.

Benwell completed Buddle's education in a practical way which wasn't possible at Wallsend. Here on the sides of the Tyne Valley the High Main Seam which was hundreds of feet below ground at Wallsend outcropped at the surface and the whole sequence of coal seams could be traced on the sides of the valley. Buddle knew that the seams probably had the same sequence everywhere, and that consequently there were other workable seams below the High Main Seam at Wallsend where the coal was close to being worked out. Once the existence of these seams was proved by boreholes the life of any colliery could be extended and new reserves found by deeper shafts going below the main coal. This was a discovery of great economic importance which would lead Buddle along dark paths at Jarrow which would have seemed unthinkable when he examined the outcrops at Benwell on a sunny morning with the beautiful Tyne Valley stretching away to the west before him. The outcrop of the High Main Seam also brought him back to Benwell at the end of his life when he was buried in the seam in St James churchyard, a little joke from a very practical man who faced death and burial in coal every day of his working life.

The Battle against Creep

At the beginning of the Nineteenth Century Wallsend was the most famous Colliery in the world. Visitors came from far and wide to see the source of Tyneside's new power and wealth, including notably the Archduke of Austria who refused to go down the pit saying it was like the very mouth of Hell itself. The pits of Heaton, Jarrow, and Wallsend did indeed take John Buddle to something like Hell on Earth, but at first at Wallsend he knew nothing but success as he perfected the techniques which later brought him fame and fortune. Buddle revolutionised mining in the first half of the Nineteenth Century. It is impossible to exaggerate his influence upon the industry through his wide ranging consultancies which allowed him to spread his ideas throughout Britain and indeed the world. He is sometimes called the father of ventilation, and was famous as one of prime movers behind the invention of the safety lamp, but his main contribution so far as the owners were concerned was that he knew how to get more coal out of the ground than anyone else and that's what made them beat a path to his door.

At the end of the Eighteenth Century only a fraction of the coal was taken out of the seam in a colliery, most was left in pillars which supported the roof. If too much was taken the pillars would be unable to support the roof and be pushed into the floor, something pitmen then called creep. Look at the plan of a mine in the early Nineteenth Century, it's a complicated grid of tunnels, a deadly maze which needed to be managed otherwise gas would accumulate in dead (unventilated) areas. With creep the tunnels would close blocking the airways and releasing explosive gas, and once started it was remorseless and irresistible leading to the total loss of the coal in the crept workings and sometimes the loss of the colliery.

Buddle learned all about creep at Hebburn. Hebburn colliery situated on the grassy banks of the river Tyne opposite Wallsend was a dangerous pit, more dangerous than Benwell, Wallsend, Heaton or any of the other pit he worked at early in his career. Hebburn had fiery seams and blowers, jets of inflammable gas escaping from pockets in the coal, which were likely to come off at any time causing fires and explosions when they were ignited by pitmen's candles. Most blowers were short lived and lasted only a few hours, but some were almost permanent, had names and had to be piped up the shaft to clear the gas from the workings. The risk of an explosion which was always present at Hebburn was compounded by creep in 1806 when Buddle took over the viewing of the colliery from his father. Creep put the whole future of Hebburn at risk, threatened the lives of all the pitmen, and presented Buddle with one of his greatest challenges as the viewer of the colliery. It was a challenge he met head on and it is a testament to his technical skill and judgement that more lives were not lost during what was a time of extreme danger.

Buddle's memorandum book, his written instructions to the underviewer and deputies at the colliery, has survived in his papers and it records his epic struggle to save Hebburn from creep in the workings and the courage and tenacity of the pitmen who worked in appalling conditions against what must have seemed an implacable and invincible force of nature. Buddle viewed both Hebburn and Wallsend at the time as well as already having interests in other collieries, but his written instructions in the memorandum book leave the reader in no doubt about his grasp of the situation at Hebburn and his attention to detail in what he expected from his assistants and deputies. On the 4th page of the first book which dates from 1808 Buddle wrote.

> <u>December 12th 1808</u>. As the waste in the north way in this pit (the C pit, Hebburn had three shafts or pits which were all connected, the A, B, and C pits) falls very heavily and occasionally discharges inflammable air copiously, the neglect of a door (being left open) might be attended with the most serious consequences, in risking the lives of the workmen, and doing the most serious injury to the colliery. (Buddle, HM)

In later entries Buddle described in great detail how the air course of the pit should be directed and on Christmas Day 1808 he gave the underviewer and overmen at Hebburn the following bleak Christmas message.

> This plan of ventilation if strictly entered upon and none neglect committed will prevent any serious fires from taking place, but from the great number of scattered blower threads which are met in every section partial fires may be expected. The <u>most</u>

<u>strict attention</u> (his underlining) must be paid to the overmen, to see that they acquit themselves of their duty in its <u>fullest extent</u>. (Buddle, HM)

Things didn't get any better in the New Year.

January 9th 1809. Through the workings (in the C pit) which are very fiery from the great discharge of inflammable air from an infinite number of threads in the roof. The ventilation is however complete in all its ramifications, and consequently the workings are in as safe a state as the nature of the situation will admit, but the greatest vigilance is necessary in the overmen. (Buddle, HM) By the end of February Buddle had something else in addition to blowers and threads to worry about:

> <u>February 27th 1809.</u> Went down the east mothergate (the main roadway in the A pit) as far as the 2nd crossing (which is as far as the air is yet conveyed to the eastward) and travelled into the second north board where our progress was stopped by a heavy fall. On listening here a constant <u>fisteling</u> (his underlining) of the walls together with now and then a <u>thud</u> gave me reason to apprehend an incipient creep, and as symptoms of this sort ought not to be neglected, as the consequences of a creep in this situation may ultimately prove fatal to the colliery, it is absolutely necessary to ascertain the fact as to the existence

and extent of this creep and also the best mode of stopping its progress. (Buddle, HM)

By the 6th of March his worst fears had been realised.

As it is now clearly ascertained that those division of the waste (old workings) north of the 2nd crossing is creeping the most effectual measures must be taken without delay to prevent its extension to the westward. This can only be done by stowing a barrier of sufficient strength from the E mothergate to the north boundary. (Buddle, HM)

Stowing meant packing the old workings with strong stones to support the roof, a laborious and for the pitmen dangerous operation. Men had to manhandle heavy stones in places where blowers and threads made candles dangerous so they worked in the dark or relied on the shower of sparks from a steel mill (a hand held grinding wheel) for light. A short and terrible entry from the memorandum book illustrates the dangers the stowers faced every day.

> <u>July 5th 1809.</u> William Lawson, a stower in the A pit, had his back broken by a side waifer (a flake of rock) this evening and died in the course of the night (Buddle, HM)

Disregarding the dangers the stowers worked on day after day, week after week, month after month, but despite all their efforts creep moved relentlessly through the workings like a trap slowly closing and after more than nine exhausting months the struggle to save the A pit had reached a critical phase, and it was sucking men into the battle to save the pit in men like the tidal whirlpool in the river below colliery sucked in passing driftwood. By then coal production at the colliery had almost stopped and the owners were starting to get worried.

> <u>February 2nd 1810.</u> The 17th, 18, 19, 20, 21, 22, 23, 24, 25, and 26th north east boards must be stowed with all possible expedition. The length to be stowed in each of these boards must depend on circumstances, and will be pointed out afterwards. I will endeavour to obtain men from Wallsend and Heaton to stow as above again Monday night in which case the B pit men can return to coal work. (Buddle, HM)

> (Later in February another of Hebburn's pits came under threat.) <u>February 12th 1810.</u> As the safety dams (walls to stop gas spreading) in the B pit show symptoms of being under great pressure it is to be apprehended that the creep may have stopped the communication with the A pit in which case the foulness (inflammable gas) in the B pit waste must be completely pushed up. Should that be the case the dams <u>must</u> (his underlining) sooner or later be forced by the elasticity of the confined inflammable air, and the consequences of that may be absolutely injurious to the colliery besides the great loss of lives which might take place. (Buddle, HM)

Buddle gave detailed instructions on how the gas could be safely removed up the shaft by pipes and air boxes and once again stressed the need for vigilance. On February 22nd 1810 he calculated the cost of the stowing operation to have been nine hundred and twenty two pounds, a massive sum for the owners to cover, and soon after that he was forced to concede that despite all the effort and expense the operation had failed.

> <u>March 2nd 1810.</u> All the circumstances give me too much reason to think that the creep has actually got over the barrier (the old workings filled with stone). It is therefore necessary that the air should be turned immediately as it formerly had to keep the foulness discharging from the creep from the C pit as much as may be. The men must continue stowing as long as possible, and when they can no longer continue their work, they must bring out all their gear and take it to the C pit. (Buddle, HM)

Faced with the failure of the stowing effort in the A pit and the growing threat to the B and C pits the worried owners called for an independent professional report on the 10th March 1810. The report made no criticism of Buddle's management of the colliery and recommended a renewed campaign of stowing to save the C pit recognising that the A and B pits were in all probability lost. A further lengthy report dated 9th April 1810 recommended that in the face of further expense the owners should attempt to extract as much coal from each of the pits in the short term and abandon the colliery when it became impossible to work. It was a dangerous plan and one which Buddle felt he could not support. The report discounted Buddle's proposal to work coal from the deeper Bensham and Low Main seams thought to exist below the High Main Seam because their existence was not proved in any neighbouring collieries, and at a meeting on Wednesday 18th July 1810 Buddle gave the owners six months' notice of his resignation as viewer with effect from the end of the year. "My resignation was accepted" he wrote without comment suggesting that the expense of the failed stowing operation might have somewhat soured his reputation with the owners, but by then he had the answer to the problem of creep which meant that soon colliery owners all over the north would be seeking his services. He would work seams in districts separated by wide barriers of coal and let the roof collapse as the coal was taken out and the coal face retreated. It was not necessary to leave pillars of coal to support the roof so more coal could be taken out and the roof collapse was planned and controlled, not unpredictable and dangerous like creep.

Buddle continued to work diligently to protect the colliery and get the remaining coal reserves out of the working pits for the remainder of his term as best he could. His calls for care and vigilance in the face of the ever present danger of gas were repeated often in the memorandum book, but on the 20th October 1810 five men lost their lives in a fire which even the greatest vigilance could not have prevented.

October 20th 1810. The wastemen (experienced pitmen who kept the ventilation passages open in old workings) opened a passage through the first dam north of the shaft this evening, and were cleaning out the levels down the narrow boards when the inflammable air fired at the mills. The fire was small and went out again immediately but 5 of the wastemen were unfortunately killed and one burnt. (Buddle, HM)

Buddle knew all the men personally and recorded their details in his book. The small fire left three widows and ten orphans with another on the way to face an uncertain future for the widows picking coal on the heaps, for the girls in service, and for the boys tending doors underground. He does not say what happened to the widows and orphans, it was customary for the owners to help by finding work for widows and there would have been a collection among the men in neighbouring collieries for their relief but it was never enough to replace the wages of their men. In later years Buddle advocated the establishment of a permanent relief fund for the victims of mining disasters as a form of insurance for pitmen's families. He accepted though, as everyone did then, that deaths from explosions and rock falls were inevitable, but that did not mean he accepted that nothing could be done to reduce the number of deaths. Explosions were not acts of God as coroners and owners often claimed, they were natural events and if they could be understood they could be prevented. This belief was a driving force behind Buddle's work in all his pits and his notebooks and journals are full of detailed accounts of pit disasters. The tragedy is that despite all his efforts there were so many, but as Hebburn shows he was not careless with

the lives of his people. The disaster of 1810 also taught Buddle a lesson he never forgot, he learned that all lights down the pits were dangerous, and this convinced him that a safe lamp could save many lives. His part in the development of a safety lamp, the Davy lamp, was with the building of Seaham Harbour the proudest achievements of his life and his memorial in Benwell church shows him with a steel mill and a Davy lamp showing how science made safe lights in mines possible. Steel mills were used in the most dangerous places and were thought to be safe, but Buddle knew they could cause fires and explosions. He noted in his diary "this fire happened precisely in the same way as every other fire that I know of has happened at steel mills, viz at the <u>very</u> point where the fresh air and the inflammable air met" (Buddle, HM).

It was the mixture of the gas and air which was important, gas only fired when the mixture was right, and that meant that to prevent explosions properly planned ventilation was crucial. It was another important lesson from Hebburn he remembered all his life.

Despite all the gloomy reports Hebburn Colliery survived the creep, the pitmen found new coal by cutting through the creep to untouched reserves in the High Main Seam, a process begun by Buddle before he left, and later new shafts were sunk to the Bensham and Low Main seams as Buddle recommended. His associate Matthias Dunn took over as viewer at Hebburn after he left and Buddle remained in close contact with Dunn and Hebburn when he became viewer of the neighbouring Jarrow Colliery in 1811. Buddle continued to view Wallsend, and it was here rather than Hebburn that he wanted to devote his attention because after a long period of apprenticeship to his father at last he had the chance to try out his own ideas and he knew exactly what he wanted to do.

The first ten years at Wallsend after the death of his father in 1806 were probably the greatest of John Buddle's career in mining. During those years he showed his ingenuity and leadership untroubled by the disasters of later years and made Wallsend the most famous Colliery in the world, a symbol of the new rising power of the age. This was by no means inevitable when he finally got command at the age of 33. Wallsend was one of the largest and most profitable collieries in the northern coalfield and the label Wallsend coal had become a byword for quality on the London market, but by 1806 the era of easy profits was coming to an end. Wallsend's success was largely due to an accident of geology; the High Main seam at Wallsend was thick and untroubled by dykes so unlike Jarrow or Hebburn it was safe and easy to work. Buddle's succession to his father's old job was not a surprise, it was almost a tradition in the coalfield for the son to follow the father, but he also had the benefit of his long apprenticeship and training under his father which allowed him to meet the challenges of a changing industry. Traditionally the viewer was not the manager of a colliery in the modern sense of the word, he was the owner's representative charged with looking after the owners interests and managing the production or vend of the colliery. There was no competition between different owners or collieries, the
coal trade was a cartel and each colliery had its own quota on the market. Wallsend's was 70,000 Chaldrons (a Newcastle Chaldron was 53 hundredweight), later reduced to 60,000, and most of the viewer's time was spent negotiating leases with landowners and keeping records of production so that a colliery was able to take full advantage of its vend or quota, with a shortfall seen as the most serious problem a viewer might face. The post was for most viewers at best part time and at worst something like a consultant whose advice was only sought when it was thought to be needed. The real work was done by the underviewers, overmen, and deputies who actually ran collieries on a daily basis and dealt with the many technical problems of ventilation, safety, and transport.

Buddle was different; he saw himself as a mining engineer at a time when the profession didn't really exist. He understood the new technology of iron and steel in a way that few other viewers did and could manage technology to reduce costs and increase profits in a way that no one else could. He knew mining was about planning for the future and balancing the different demands of production and exploration to secure a stable level of production appropriate to the vend of the colliery. He marked his promotion by beginning a journal which was to become a record of the production and costs at the colliery, a technical notebook, and a narrative of the daily work of the colliery. Buddle's sister Ann probably acted as his personal assistant and organised the notes that he later wrote up, and some of the writing in the later journals could be in her hand. Many of pages are routine, lists of fortnightly workings, hewing prices, and the calculations of the annual cost of everything used in the pit from hay and timber to oil and candles, but sometimes they are dramatic and gripping and tell the story of the dangerous life of a pitman, and Buddle's personal courage and outstanding leadership which was the key to his success not just at Wallsend but everywhere he worked.

Buddle knew he faced greater challenges at Wallsend than his father who had been viewer when the colliery was new, the ground largely untouched, and the treasure house of the High Main Seam still unexploited. Buddle's working life revolved around the consequences for the mining industry and its people of the working out of the Seam and the search for new coal to replace it. The new seams were deeper, more difficult to work, and much more dangerous than the High Main and posed problems which Buddle could not have anticipated when he took over his father's old position in 1806. Buddle understood Wallsend was a mature colliery and that new methods would be needed to keep it profitable in the future. Much of the first Wallsend Journal records his lengthy negotiations for the rights to mine the Glebe (Church) Land which was the only untouched part of the Wallsend royalty and the only place he could work whole coal from the Seam. The future of the colliery also depended upon taking more coal from the old workings, robbing the pillars and barriers which still contained about sixty per cent of the original coal in the colliery. It was a difficult and dangerous operation which inevitably led to creep, but Buddle's experience at Hebburn had taught him some valuable lessons. At Wallsend he didn't try to prevent it as he had at Hebburn, but planned to manage it as part of his plan for the Colliery in a way which had never been done before. Buddle never lacked confidence and at Wallsend he was ready to take on something that pitmen everywhere feared as a relentless force of nature. His success made his reputation and propelled him into the first rank of viewers far beyond the achievements of his father which in themselves had been considerable.

Buddle's Journals are a record of his entrepreneurship and innovation in transport and extraction, the two most important parts of mining. He introduced cast iron tramways underground, with stationary engines and self-acting inclines, replaced horses and sledges with ponies and rollies, and halved the number of horses at every colliery he managed. He understood the problems of ventilation better than any of his contemporaries and split the air course so that each district got its own supply of clean air. Controlling the air course needed many barriers and doors which greatly increased the number of children employed underground as trappers. The spectre of child labour has haunted Buddle's reputation ever since Lord Ashley's enquiry of the early 1840s, but he was by no means opposed in principal to regulation and reform and as the spokesman of the coal trade committee his own views were considerably in advance of those he represented. From the point of view of the pitmen he worked with though Buddle was not the cold and calculating engineer of the Journals, he was a great leader. The story of mining in the first half of the Nineteenth Century was a journey into the unknown, like an explorer moving into a perilous uncharted land, or an army invading a country far from home where supply lines were stretched and the risk of attack was ever present.

Buddle named the districts in his pits after great battles like Waterloo and Trafalgar; it gave the pit geography of its own and perhaps provides a clue about how his mind worked. Suppliers said he was like a shopkeeper, always comparing prices, and marking them up or down whichever was to his advantage, but at heart he was a soldier and an adventurer. Working the waste (the old workings) in districts (all of the coal in a district would be removed allowing the roof to collapse working backwards towards the shaft) was new and unknown territory, previously the face had moved forward in boards and headways leaving the pillars behind, and the pitmen needed strong leadership to make it work. That was Buddle's secret, at his best he was a great leader, visible and certain of his course which gave his men confidence. We rightly celebrate the heroes of war or exploration, but the dangers of Buddle's great leap into the unknown were every bit as great as those of the Arctic and the chances of escape when things went wrong were every bit as remote. In the end Buddle for all his leadership and technical skill couldn't stop things going wrong and that was the tragedy of mining which cost thousands of lives in the first half of the Nineteenth Century, but in 1806 that was a long way in the future and at first at Wallsend things went better than even Buddle might have dared hope. If he saw the pit as a battlefield and himself as a general in 1808 he also certainly believed he had a real battle to fight. He wrote to the owners in apocalyptic terms on the 29th November 1808 in a letter copied into his journal in full:

> Sir, the tedious negotiations with the Dean and Chapter being at last concluded in a way which I trust will be satisfactory to you, and as the chief object of the renewal of the Lease, was to obtain the privilege of working the Glebe, I feel it is incumbent upon me to state for your satisfaction, the causes and motives which induced us to close with Blacket so promptly, and to give him a sum of money for the Glebe Coal, which you might perhaps think too large, unless you were fully appraised of the circumstances of the case. I must however promise, that what I have to advance on the occasion, must not like H Dalrymple's dispatch, be considered as the language of apology, written under the impression of having acted improperly, but on the contrary, as a statement of circumstances written under the fullest conviction of having done nothing more than what the nature of the business absolutely required, and which I have not the least doubt, will be fully justified by the event.

> Menaced as Wallsend Colliery is by Mr Brandling prudence requires that every possible means of prevention, or palliation at least, should be resorted to, and as any ulterior

measure of security are not <u>absolutely</u> to be depended upon, sound policy points out the propriety of availing ourselves of our internal resources, which are the only certain means of security in our profession. Under this impression the following are the outlines of the plan for the future management of the great scale of the Colliery workings, and which have already been acted upon to a certain extent.

> 1. The Colliery to be divided into two grand divisions, separated by a strong Barrier capable of resisting any possible pressure of water etc. that can be thrown against it.

> 2. The above divisions to be distinguished by calling the NW division the old Colliery and the other or SE division the new Colliery.

> 3. The old Colliery contains about 800 Acres and the A, B, C, D, E, and F pits are sunk in it.

4. The new Colliery contains about 390 Acres and the G which is a double pit is sunk in it.

In the old Colliery, the D and E pits are entirely wrought out, and the A, B, C, and F are so far exhausted that they may be wrought out in two years. The workings of the G pit have not yet made much impression on the field of coal in the new Colliery. Now as Mr Brandling has begun to work his Barriers which I am informed he cannot work off in less than two years, it is probable that at the end of that time, the strength and efficacy of the Wallsend Barrier next Walker, will be proved, and should it resist the pressure, the old Colliery will rest secure, but on the contrary should this Barrier not resist the pressure, the old Colliery may in that case be drowned up, but the Barrier left between the two divisions as stated in No. 1 will secure the new Colliery.

As it seems that Mr Brandling cannot consistently with his own interest injure Wallsend in less than two years, in which time the old Colliery may be wrought out, it is certainly advisable to anticipate his intentions of drowning up Wallsend by working out the old Colliery before he can carry his plan into effect, so that in fact it may become a kind of race or competition between Mr Brandling's Barriers and the old Colliery, as to which shall be first wrote off.

To work out the old Colliery in the time above specified it is absolutely necessary to attack it at every accessible point and as all the whole mine in the old Colliery will be wrote off in the Course of a Week, the working of the Pillars must have taken place if the Glebe had not been secured. This being the case, the following advantages will result from having secured the Glebe viz. 1. The possession of the Glebe Coal, including its appendages viz. the Barriers left against it in the Dean and Chapters Ground has given the Colliery an accretion of at least 40,000 Ch. Of Coals.

2. The Glebe Coal is a valuable acquisition at this time as it will afford a proper mixture of whole coal with the broken.

3. Had Blacket not been agreed with at this time the working of all the C Pit Pillars must have been suspended, for the purpose of preserving access to the glebe whenever Blacket might have been agreed with

4. If the Glebe had not been taken at this time, it would not have been possible to work out the old Colliery before Mr Brandling's barriers were wrought off, consequently its total loss by the drowning up of the old Colliery would have been risked.

Lastly if immediate access could not have been had to the Glebe from the C Pit, that pit must have ceased to work in a few months, and being once laid in, and of course dismantled it would have cost £500 to have it reinstated here if at any future period whenever it might have been found necessary to have wrought the Glebe, even if the machine had not been removed, but if the machine had been removed it would have cost £500 at least more to have replaced it when required, besides, had this pit been laid in before the Glebe and Pillars were fully wrought the stock of horses, being mostly Glanderous must have been destroyed or sold off at a very low price and a new set purchased to replace them, but as it is, they will work the pit out.

I am Sir, your most obedient humble servant,

John Buddle. (Buddle, WJ)

Major Russell's reply to the letter is not recorded in the journal, but his agreement must have been a formality because Buddle had already moved into action concentrating on the working on the old Colliery long before the lease for the Glebe was concluded or the letter written. He knew that Russell was unlikely to disagree with his new viewer who was good with figures, careful with costs, and had already made a good profit in his first year. Buddle's plan to work out the coal in the old Colliery quickly was risky like every imaginative plan of campaign, but it was a calculated risk and Buddle was sure he could carry it through whatever happened to Mr Brandling's barriers.

He knew but didn't say that the immediate danger to the pit and its men wasn't Brandling's water, but creep in the old Colliery workings. Creep was caused by the pressure of the roof pushing the pillars into the floor of old workings and closing them off. It occurred when the pillars left behind after coal had been extracted were too small, it was unpredictable, dangerous, and in Buddle's plan to work out the old Colliery it was inevitable. Creep closed off the airways and roadways and was always accompanied by its handmaiden's inflammable air and styth. Creep could come on slowly or advance so rapidly that valuable materials, tramways and pumps could be lost. The plan depended on Buddle anticipating and controlling creep rather than reacting to it. He knew he needed to be able to think and act quickly, but his confidence in his own judgement made the crucial decisions when to work and when to pull out seem easier than they were, and the campaign went exactly as he had planned. It made his reputation as an outstanding viewer who could turn a profit in the most unexpected circumstances and opened the door for him to fame and fortune though not without some near misses along the way.

Creep was already in the E pit at Wallsend in 1806 but it was nowhere near as bad as it was at Hebburn. Buddle had been dealing with it more or less successfully for months and that gave him the confidence that he could work out the old colliery without too much difficulty.

> <u>November 4th 1806.</u> The creep took place suddenly this afternoon in the E Pit S Waste, and moved to the shaft immediately, but was fortunately resisted by the stowing, in about 3pm it became a little easier at the shaft but continued with great fury all day to the SW and NW. All the horses were sent out of the pit to Wallsend Pit and were with difficulty saved. The men's gear, the corfs, rollies, and the plate way were all shut up: No inflammable air was discharged during the night, but the

C pit separation stoppings were broken down, which laid a great part of her waste dead, and prevented her getting to work. (Buddle, WJ)

Buddle's plan depended on his ability to move men and horses between the different pits in the Colliery. Coal was still being produced from the F pit and the horses were lowered back down the E pit on the 9th November. It was a situation which was repeated many times in the different pits at Wallsend over the next few years as Buddle took men, materials, and horses out when the pit became unsafe, and put them back when he judged it safe, like a guerrilla fighter marshalling his forces to strike where they would be most effective. He was always at the front line of this strange underground battle, but his overmen, and deputies, and the pitmen themselves were his eyes and ears, they had to be alert and know the signs and sounds of danger. During the Napoleonic Wars Buddle was the commander of the Wallsend Volunteers and seems to have enjoyed parading his troops and playing soldiers, but the battle in the pit was not a game and his own and all his men's lives were at risk. It was that simple. Only he can be sure how near he came to death in an explosion on the 2^{nd} February 1807, but the experience didn't diminish his courage or his confidence although it was undoubtedly a very narrow escape and he could easily have been killed. How the history of mining could have been changed forever by just a single candle.

February 2nd 1807. Went into the E pit workings with R and W. Heppell this morning and found the creep very active within 2 pillars of the working boards and the air course in the return much loaded. Went to the innermost board up where the air goes from the workings, a fall had taken place on this board above a week ago onto the working headways course. On going up this fall which is about coal height I smelt inflammable air and looked up at my candle immediately and found the place to be completely foul although the whole body of air was going over my candle being a very bad one I requested R Heppell overman to look at his which was very good and he did so but raised his hand too hastily when the place fired immediately, after firing a pause took place a second or two which barely allowed us time to turn round and scramble down the fall and an explosion immediately followed. Another pause of about half a minute then took place immediately followed by a violent explosion. The last explosion dashed us about dreadfully and broke a great many doors and brattices, and also drew some props, the heat and whirlwind of dust and small coals was excessive and left such a smoke behind that it would have been impossible to have lived many minutes, I was covered by brattices and timber, but extricated myself and got hold of Richard Heppell and then halted for a moment and collected the party and made the best of our way to the crane which we reached with difficulty. Fortunately the mothergate doors were not thrown open, nor the board end stoppings thrown down for more than 8 or 10 boards from the far side, otherwise we could not have got out. The shock was so great that all the men in the most distant part of the pit felt it. William Heppell and myself being severely scorched in the hands and face came to the C pit to ride out and left Thomas Heppell and several others to bring out the horses. We had not got half way when another explosion took place as severe as the last, though no fire was seen, but the men were violently dashed about. (Buddle, WJ)

The explosion killed a horse and blew down all the stoppings, brattices and doors in the six innermost boards of the pit laying it off for four days. Buddle wrote in his journal that he was only slightly hurt and didn't seem to have been shaken by his narrow escape. He didn't record the full extent to his injuries though, he was as ever concerned about the pit and anxious to check its condition.

> From the last explosion we were apprehensive that the fire was not extinguished, I therefore waited till 12 o'clock, and then sent six men down who returned at three, and brought out the horses except one, they got to within 6 boards of the far side but then stopped being down the afterdamp was so strong. That they

could not proceed any further, they did not perceive anything to lead them to think the fire was in , this being the case I sent 2 men down at 6 o'clock in the morning to stay till 3 in the morning when Heppell with a fresh set will relieve them. (Buddle,WJ)

Buddle knew that creep was unpredictable, but he was not careless with men's lives, and he recognised the conditions which could lead to a release of explosive or suffocating gas and was always ready to take action. He wrote in his journal "It is to be remarked that at the time this discharge took place the mercury on the barometer stood below stormy."

Stormy weather was bad news for pitmen. Buddle kept a barometer at Wallsend House and used it to watch the weather. In bad weather he had the return of the air at the pit furnace monitored, candles were put out and work continued with steel mills (Buddle knew the sparks could ignite any gas but the colour of the sparks was a much surer and safer indicator of the presence of gas than a candle flame) and he was ready to withdraw his men at a moment's notice.

> <u>December 3rd 1811.</u> The A pit took the creep in the east way this afternoon about 2 o'clock, so large a discharge of foulness took place that it became necessary to put the furnace out at 4 o'clock. Before the furnace could be gotten out the foulness came off so heavily in the course of a few minutes, that it was upon the very point of firing. Began to draw the horses and

materials immediately, and by 12 o'clock PM had all the horses at bank, and the rolly way taken out of the E mothergate, all but about 20 yards which was lost. (Buddle, WJ)

<u>October 6th 1812.</u> About 10 o'clock this morning a very large discharge of inflammable air took place from below the east creep in the A pit. It came through the thin barrier of coal between the present workings, and the former creep, and immediately fouled the workings. Fortunately, George Green, the Deputy, discovered it in time to get all the candles and lamps out, and avoided an incident. (Buddle, WJ)

Buddle system worked by absolute obedience; perhaps today we would also call it teamwork because information went up and down the line. He issued orders and they were followed to the letter, he was certainly autocratic but the men knew that if they were in trouble he would not abandon them to die alone in the dark. That made a difference and was why they trusted him and followed his orders without question even when they didn't like his attitude to their combinations (unions).

> <u>September 6th 1813.</u> The foulness at the return of the C pit fired at the furnace this afternoon a little before 1 o'clock. A slight explosion took place and the timber at the bottom of the pit was set on fire, as was also the rough cleading in the shaft at the black stone. On the first alarm the men were drawn at the E pit. The timber in the C pit burnt furiously and not knowing the

situation of the fire exactly on the state of the air I ordered the Galloways to be drawn immediately at the E pit. Richard Heppell got down the pit a few minutes before me and with three men pushed through to the C pit shaft to discover the situation of the furnace keeper whose fate was uncertain. I followed Heppell with Richard Reay and 4 others as soon as possible. We met them on their return at the end of the W drift. They reported that they could not approach the C pit shaft for heat and smoke, and the falling of stone, nor had they found the furnace keeper. We therefore resolved to search all the drifts thinking that he had mistaken his way. I went up the W Pit drift with J Read but he was not there. On returning we met the other party who could not find any trace of him. I then resolved to go to the C pit shaft, and ordered Heppell to continue the search for the furnace keeper. Accompanied by J Read and two of the wastemen I went to the C pit shaft. The timber, coal, stone, and rubbish about the bottom of the shaft were in a mass of fire, and so much stone had fallen from the Balm Stone, and out of the shaft as to nearly close the ingate. The falling of the stone had however diminished, and observing the return of the air to be tolerably down on the furnace I thought it practical to extinguish the fire, especially as water was at hand. With that view I took the furnace keepers shroud, and in 10 minutes succeeded in

extinguishing the flames in the timber and about the bottom of the pit, but a quantity of inflammable air continued to blaze from behind the furnace wall, and finding my means insufficient I returned to the E pit under the conviction that if the fire blankets were applied there was no reason to think the fire might be gotten out. On my return we overtook Heppell and his party. They had found the furnace keeper in the back headways between the pits. The fire blankets were procured as soon as possible, and Heppell returned to the C pit with 8 good men, and in about 2 hours got the fire so much under as to get a corf down the shaft. (Buddle, WJ)

Buddle carefully listed the details of every death at the colliery in his journal. Fourteen men and boys died at Wallsend between 1806 and 1816, five fell down the shaft, seven were crushed by falls of stone, one was run over by a coal wagon, and one died after being hit by the pit engine beam. Pits were dangerous places for the unwary and Buddle clearly regretted these incidents and saw the human tragedy behind them but he knew they were isolated accidents. He recorded the details of all the men and boys who were killed at his collieries in his journals and looked for patterns so that they could be prevented, but he was only too aware that sometimes human lives hung by a thread and could be lost by the most random of events. Perhaps this more than anything else was the reason for his belief that perhaps the loving merciful God people prayed to in the Church of England did not exist. Certainly He seemed absent in this incident where one boy died and two lived by no judgement other than blind chance.

> June 18th 1812. Wright, driver, 14 years of age was killed this morning in the G pit. When the pit was down at the end of the shift, the Banksman by some mistake or misunderstanding put in the Pick corf against a corf full of lads riding. The lads were not aware that the picks were in, nor the Banksman that the lads were riding, but at meetings Wright being on the top was knocked off. It is curious to comment that 3 lads were on the top, Wright being in the middle, having one above, the other below him. He was knocked off by the Pick Corf unknown by the rest, who never missed him till they came to bank. (Buddle, WJ)

By such misfortune was a young life lost, a one in three chance without reason or justification? It was cruel and it shouldn't have happened but it was the result of a very human error. Between 1806 and 1816 no one died at Wallsend as a result of a fire or explosion although there were some narrow escapes. As Napoleon might have said Buddle was a lucky general, although there was more than luck about the way he avoided disaster at Wallsend. On Tuesday 19th March 1811 the people of Wallsend had a very frightening experience, rumblings came from deep underground, their houses shook and the walls cracked. A white vapour like steam came out of the mouth of the F pit for some time. It could have been the sign of a terrible disaster, but Buddle had already laid the pit off and there was no one underground. The disturbances continued for some time giving the people of Wallsend reason to be grateful that Mr Buddle seemed to know exactly what he was doing.

> <u>March 28th 1811.</u> The inhabitants of Wallsend were very much alarmed last night by the shrinking of their houses. Their doors stuck fast, the plastering on the walls cracked, and the flags at the ground floors parted at the joints. (Buddle, WJ)

> <u>February 15th 1814.</u> The state of the E pit is upon the whole very critical, as the workings to the west are so cramped by the standing water as not to admit of a double return for the air. We are therefore liable to have the foulness from the S West going into the first of the air in the rolly way drift which may occasion a serious accident; every possible vigilance must therefore be observed to guard against such an occurrence. (Buddle, WJ) <u>April 25th 1814.</u> Examined the state of the E pit this morning. The return of the air from the NW and N ways is very heavy, and a good deal of foulness still continues to discharge from the E pit. Under these circumstances I cannot consider the pit in a safe working state, as the air course is subject to be overpowered.

(Buddle, WJ)

Buddle in 1815 was at the peak of his confidence. Things at Wallsend had gone very well and his activity as a viewer was expanding as he took on other collieries and made some wise investments. However in the pits as he knew no human life was safe and fate was about to give him a lesson he would never forget. It was to be the first, but by no means the last reverse of the second half of his long career in mining.

The Deluge

Heaton haunted John Buddle for many years after the terrible disaster which took the lives of seventy five men and boys at his colliery just outside Newcastle, but it brought him to his sister Ann and forged the closest relationship of his life. John Buddle never married and he lived with Ann at Wallsend House for all of thirty five years. Such partnerships were common in the Nineteenth Century, but even by the standards of William and Dorothy Wordsworth John and Ann Buddle were exceptionally close. Ann was just nineteen when her father died and she was left alone at Wallsend House with her brother, her mother having died some years earlier and her two elder sisters having married. Theirs was not an obvious or an easy relationship: in 1806 Buddle was thirty three, a generation away from Ann, almost old enough to be her father, and she stayed with him more as a housekeeper like a dutiful younger sister than as the partner she was to become in later life. In 1815 they were not yet a couple. John Buddle was forty two and Ann Buddle was twenty nine, still young enough to make a good match as both her sisters had done, but the terrible disaster at Heaton threw them together and through the difficult years that followed their relationship grew and deepened until it was her strength that rescued him in his darkest hour when even the pitmen themselves seemed to have turned against him. That though was many years in the future in the spring of 1815 when after his success at Wallsend and with the safety lamp almost complete it seemed that the world of mining at lay at John Buddle's feet.

Nothing in Buddle's thirty years' experience down the pit, he always said he first went underground at the age of six, could have prepared him for what happened at Heaton. He joined the Heaton Colliery Partnership in 1807 probably putting money from his father's estate in the enterprise, and must have seen Heaton as a useful addition to his growing portfolio of investments. Heaton had a vend of 30,000 chaldrons, much less than Wallsend, but it was a profitable pit and as one of the owners Buddle got a 9/96 share in the profits for his investment. His journal doesn't say how much he paid for his share, but the £1529, 12s, 9d he received for his first dividend was a small fortune, more than some pitman earned in a lifetime. Buddle was appointed viewer of Heaton when he joined the partnership, probably the shares were an incentive for him to take over the management of the pit, and it was just the sort of place his technical skills could be employed to great effect. Heaton was an old pit, surrounded by worked out and abandoned collieries, Buddle knew how to safely extract the coal from the pillars in old workings and make them pay. He was almost certainly invited into the partnership for that reason and as soon as he arrived he started calculating the extent of the coal reserves, devising a plan for the extraction of marketable coal, and calculating how far costs could be reduced by better engine working and haulage.

Men and horses were often switched between Heaton and Wallsend making for flexibility of working and economies of scale, Heaton in 1807 was a large operation employing 252 people and 103 horses. In 1812 there were 176 people and just 34 horses producing the same amount of coal as Buddle's modernisation began to pay. Heaton was not a fiery pit like Hebburn, but it was wet; water came in from the abandoned workings of the surrounding pits which were flooded and this made Heaton difficult and expensive to work. Here another of John Buddle's special skills was important, he was very good with engines and his Heaton diary shows how he got the best out of the engines at Heaton for the least cost. William Chapman's experimental locomotive was even used as a pump at Heaton in August 1813 after it failed to impress Buddle in trials at Wallsend. Buddle commented in his diary that it was a powerful engine but the boiler did not supply enough steam for it to work at its full capacity as a pump.

By the standards of the day Heaton was a safe pit. There were of course the inevitable losses of life by falls of stone, falls down the shaft, and accidents with machinery, but these were part of the life of any pit. Buddle carefully documented all incidents and the worst loss of life before 1815 seems to have been on the 19th February 1814 when three boy trappers were killed. Buddle found they had left their posts and went to play in an unventilated area where their candle fired inflammable gas. They were just ten years old and couldn't read the warning notices put up at the entrance to the place, a pit was a dangerous place for children and Buddle's use of child labour has dogged his reputation over the years following his death, but boy trappers were employed in all collieries in the early Nineteenth Century and he paid higher wages than most.

Trapper boys opened and closed doors which controlled the flow of air through the pit, it was a low paid but vital job, and if a door was left open places could become dead and gas would accumulate with disastrous consequences. Buddle practical as ever thought old men could not be trusted to do the job as they would fall asleep in the long dark hours sitting by their doors, and he was sure boys were better, but the system had a terrible impact on the lives of the young whose childhood was stolen for the sake of coal.

The main danger at Heaton was water. Breaking into flooded old workings could lead to a dangerous flood which would drown the pit and the pitmen alike. Buddle's men went forward cautiously, testing the way ahead with bore holes like a blind man feeling his way with a stick, and looking for signs of water in the face and roof of drifts. Sometimes water shot out three or four yards from test bores with great force and there was always the risk of gas in old workings, but up to 1815 his methods seemed to work. He had great skill in planning the air course though the pit and making sure each district got its share of the first of the air, and he applied science to his work, bringing a barometer to the pit and teaching his underviewers how to watch the weather and identify when there was the greatest risk of a discharge of gas. To Buddle compared with Hebburn or even Wallsend Heaton posed relatively few dangers, but in 1815 he took one risk too many and seventy five men died. The chain of events that led to the disaster of 1815 started on the 6th December 1814 when the Heaton shaft started to collapse. Timber piling holding back a layer of sand some 36 feet below the surface broke, partially blocking the shaft and undermining the wall of the engine house. Production was immediately stopped, leaving the pit horses underground as they couldn't be drawn up the shaft now reduced to a fraction of its original diameter. They would have to survive on what fodder was in the stables or starve if the shaft couldn't be repaired in time. Buddle came immediately to survey the damage and quickly devised a plan for reinforcing and rebuilding the shaft and got the horses out safely.

In the event the pit stopped production for a month only restarting again on the 9th January, but no lasting damage was done. During the layoff Buddle drew up a plan to extend the Heaton workings into the area of the old Heaton Colliery now abandoned to increase production and make up for the month lost. It was a risky operation, the old Heaton waste would certainly be flooded and the men went forward slowly in two drifts. By the end of January the lower drift was showing unmistakable signs of water at a dyke that was almost certainly the boundary of the old Heaton workings and Buddle stopped the work to concentrate on the other higher drift which seemed dry.

He calculated it would take twenty weeks to reach the old workings and the drift crept forward uneventfully until the 25th April when again obvious signs of water were seen. "Great care to be taken in borings" he wrote in his diary. On Tuesday 2nd May the overmen reported the coal was "tolerably dry" in the borings and there was no suggestion that the flooded workings were near. Whether they missed the signs or they were just unlucky will never be known but at 5am on the 3rd May 1815 a great volume of water broke through into the drift and drowned the pit. Here Buddle's own diary can take up the story:

> At a little before 5 o'clock this morning the water from Heaton old waste burst into the stable drift with such violence that the hewers (and) putters inby had not time to escape. In little more than half an hour the water was 10 fathoms (60 feet) up the old pit shaft. The following individuals only escaped this dreadful catastrophe ... 24 in all. 75 perished. The three men who escaped from the drift gave the following account.

> Miller was with them about 20 minutes before the accident happened – they observed to him that there was a greater bleeding of water than usual and thought it advisable to (close) the drift. He replied that the 9 o'clock men should (close), but that he wished to have 2 feet of coal on before he (closed). After he had left them 20 minutes, a discharge of water took place from the west side of the drift – in the coal – like the spout of a garden pot, with a loud hissing noise – this discharge was from a (break) in the coal. This did not alarm them and they remained for some time when the coal broke away and the

feeder increased to the size of a pump with a noise louder than the engine steam. This alarmed them and they came out of the drift and sent their putter boy to alarm the people at the cranes – at the same time they came to the old crane – about 110 yards from the face of the drift. After waiting here for a short time John Bell determined to go back to see the state of the drift but just as he reached the (?) door, the water broke in with a noise like thunder and the wind blew him down: he then made the best of his way to Cadwell and they scrambled outby as best they could in the dark – their candles being blown out by the violence of the wind which continued very violent as long as they were in the pit. They reached the shaft with difficulty accompanied by their putter boy, and Mr Holt the rollyman in the far NW mothergate came out with them. They also brought several rolly drivers and trappers out with them but old Edward Gibson the rolly way man was not able to come as quick as them and he perished. (Buddle, HJ)

For those on the surface that bright late spring morning, the twenty five pitmen who had escaped, others from the resting shift, and relatives of those still trapped underground the scene at the surface was terrifying. Within twenty minutes the water was sixty feet deep in the engine pit, the pit where the men were, and by the afternoon it was a hundred and twenty feet up the shaft. Buddle's diary describes the scene: Almost immediately on the accident happening the following old pits fell in: The Chance, Old engine, Thistle, Knab, Venture, and Bank. The Chance seemed to have been scaffolded and appeared to be open nearly to the bottom. Balks were laid across and preparations made for securing the top of the shaft with a view to get down the pit. But at about five PM the top of the pit – being sand – broke away and continued to run without ceasing until it formed a complete crater sixty feet deep and filled the pit up. This would be about eight o'clock pm. (Buddle,HJ)

Buddle started pumping immediately, but the pumps at full capacity made no impression on the water which seemed to be coming from a vast underground reservoir and flowing like a subterranean river in spate. The only hope for the trapped men was to find another way into the workings. There were plenty of possibilities, but everyone knew it was a desperate gamble; old pits were death traps, a maze of half collapsed shafts and tunnels filled with gas, only madmen would want to go down them, but there was no shortage of volunteers and Buddle himself led the way. For the watchers on the surface the horror grew as the devastation underground became obvious and all hope started to fade as the pumps failed to reduce the level of water in the shaft by more than a few inches after hours of pumping. <u>Thursday 4th May 1815.</u> About two o'clock this morning the old north engine pit broke in with a tremendous crash. It is to be remarked that when the south engine pit broke in yesterday morning the air rushed in for about an hour with the utmost violence. A violent torrent of water seemed to be rushing past the bottom of the venture pit last night but it could not be heard this morning. Whether this might be caused by the bottom of the pit being choked up by the rubbish which fell from the top or from the water having run off is uncertain. (Buddle, HJ)

Two days after the accident Buddle found what he was looking for and an epic rescue attempt which made an abandoned pit the centre of attention of everyone's hopes began. Pumping offered no hope, except that bodies would be found months later when the pit was finally cleared, but the rescue attempt kept the flame burning like a tiny candle in the darkness and for Buddle and his men it was a chance they had to take. Buddle's diary tells the full story:

> <u>Thursday 5th May 1815</u>. The far pit plug was examined last night at nine o'clock but the water seemed as strong as ever... Bored several holes in the course of the day in search of the Matthew Pit but without success... found the Kenton Pit by boring this evening – the shaft seems to be scaffolded at the stone head about three fathoms (eighteen feet) down (Buddle, HJ)

<u>Saturday 6th May 1815.</u> The engines went without interruption all night but the water was found to be lowered just two feet...Opening out and securing the top of the Kenton pit – bored through the scaffold when a considerable quantity of inflammable air discharged from the shaft. Plumbed the shaft and got the line thirty eight fathoms (two hundred and twenty eight feet down). There must be sixteen or seventeen fathoms (ninety six to one hundred and two feet) of rubbish in the pit as the shaft appears to be fifty five fathoms (three hundred and thirty feet) deep. (Buddle, HJ)

In twenty six hours of frantic pumping with the engines at full capacity the water in the shaft which was more than a hundred and twenty feet deep dropped just three feet. The crowds watching and waiting at the surface for news knew the rescue attempt was the only chance for the trapped men and now all eyes were fixed on Kenton Pit. It is difficult to imagine the stress Buddle was under now; all the crowd's expectations rested on him, but if something when wrong at Kenton Pit more pitmen would die and he would be blamed, the balance between caution and haste was not easy to get right, and more than just seventy five lives depended on his judgement.

> <u>Sunday 7th May 1815.</u> Got a second length of timber put into the Kenton Pit. The styth (gas) comes very strong up the bore hole through the scaffold. (Buddle, HJ)

<u>Monday 8th May 1815.</u> Got the Kenton pit cleared out to the scaffolding this morning and took up a plank but the styth came out so strong as nearly to kill William Patterson. The making of air boxes immediately commenced, and the work was suspended until the ventilation of the shaft can be effected. (Buddle, HJ)

Meanwhile the pumping effort was not going well, with the engines working round the clock and the corrosive mine water destroying the buckets of the pumps breakages had started to reduce the engines pumping time and even the pitiful rate of progress since the disaster couldn't be maintained. On the eighth of May the engines were stopped for five hours for cleaning and the water in the shaft was only reduced by one foot. Buddle calculated optimistically about one sixth of the water had been drawn off by then, but it was far too little. The next day one of the engines was stopped for two hours to change the buckets and the other was on reduced capacity for five hours until one of the three boilers was cleaned and the focus of the crowd was more than ever on Kenton Pit.

> <u>Tuesday 9th May 1815</u> Occupied all day in putting the air boxes into the Kenton Pit. Took out the scaffold (the framework at the top of the shaft) (Buddle, HJ)

Water was still flowing strongly through the workings and it was now almost up to the top of the last shaft at Heaton, the Far Pit, which had escaped the initial inundation. Wednesday 10th May 1815. Got the scaffold in the Kenton Pit out and finished the timbering of the top of the shaft. Got nearly thirty fathoms (one hundred and eighty feet) of air boxes into the Pit which cleaned the shaft so much as to allow the men to go twenty fathoms (one hundred and twenty feet) down. The timber is all standing and is sound and good, but the cleading is gone to be fresh nailed. From the old view book that Richard Donkin gave me yesterday the Kenton Pit would seem to be about forty three fathoms (two hundred and fifty eight feet) deep in which case there is not more than four fathoms (twenty four feet) of rubbish in the bottom. The wind has blown strong from the west today which has enabled the air boxes to clean the shaft, and I have gotten the small air pump from Wallsend in readiness to apply to the boxes in calm weather. (Buddle, HJ)

Buddle calculated the pump would take thirty five minutes to clean the shaft and wanted to be sure it was safe before the men went down to continue the work. It was now a week since the inundation and people said they could hear the trapped men knocking and calling for help, He knew it was just a combination of a desperate hope and a fertile imagination, but it wouldn't have helped anyone to say so and he and his men just kept working.

> <u>Thursday 11th May 1815.</u> The engines went all night and lowered the water two feet... Got the air boxes to the bottom of the

Kenton Pit and applied the air pump which soon cleaned the shaft. The men got the shaft secured to the meetings. Ordered them to continue at work all night with the steel mills. Got Mr Straker's gin from Ouse Burn set up ready to draw the rubbish out of the bottom of the pit...(Buddle, HJ)

<u>Friday 12th May 1815.</u> Got more pumps set up but the water only lowered a little... Got to the bottom of the Kenton Pit this evening about eight o'clock and began to send away the rubbish. The air pump has kept the shaft very clean, there is a ring in the old shaft at the top of the rubbish from which I conclude the bottom is very near. More air boxes must be prepared as I believe the best mode of penetrating the old workings will be by extending air boxes into them. (Buddle, HJ)

By the second weekend hopes were rising. Against all the odds the rescue party had found a way into Kenton Pit and were making progress down an open airway.

<u>Saturday 13th May 1815.</u> Got down the Kenton Pit this morning and in the course of the day were enabled to advance fifty two yards along a north headway. The workings of this pit are close crept and it seems the north headway has been cut out for an air course to another pit... The air course was cleaned about fifty yards before the boxes but the atmosphere was in a very favourable state – the barometer standing at 29.6. Decided upon continuing the air boxes in preparation to brattice (put a barrier down the middle of the tunnel to circulate air) (Buddle,HJ)

<u>Sunday 14th May 1815.</u> Made about forty yards further progress in the north headways from the Kenton Pit (Buddle, HJ)

There were more problems with the engines and after more than ten days of continuous work the engine wrights were exhausted so pumping was given up for the night and for the first time since the disaster the pit fell silent. There were no complaints from the crowd, the engines had lowered the water level in the shaft more than thirty feet but it was still ninety feet deep and no one expected the men to get out alive that way.

> <u>Monday 15th May 1815.</u> Got to the end of the open headway in the Kenton Pit – directed the men to endeavour to find an open board (roadway) to the east. (Buddle, HJ)

Two weeks after the disaster the news from Kenton still gave the crowd some hope. Buddle calculated the rescue party was less than a hundred yards from the trapped men and was pushing forward with all possible speed.

> <u>Wednesday 17th May 1815.</u> Have holed one wall in the Kenton Pit beyond where the headway more open and have reached another. (Buddle, HJ)

> <u>Thursday 18th May 1815.</u> Lined the Kenton Pit this morning. NB the proper name of this pit as it appears by an old plan is the moor

Pit. The whole length ridden out from the shaft is ninety nine and three quarter yards. On laying this down at the bank the face of the ridding seems to be ninety seven yards from the nearest open part of the water which was travelled before the accident. (Buddle, HJ)

<u>Friday 19th May 1815.</u> Employed the most of this day in laying tramway in the Kenton Pit to stow the drift coal – the coal is firmer in the face which leads to the supposition of its being on a barrier as it is nearly under the boundary line between Heaton and Byker. (Buddle, HJ)

All the pumps were now fully operational and working round the clock, but the water was only falling by about a foot a day. As the rescue effort pushed forward and the air lines were more stretched it was inevitable that gas would be a problem and after two weeks work at Kenton was stopped and the men only just escaped with their lives.

<u>Saturday 20th May 1815.</u> A great discharge of styth and foulness took place in the Kenton Pit this morning which compelled the men to leave off work – it came off very suddenly and it was with the greatest difficulty that the men escaped. The air pump could not control the discharge and in a few minutes the pit was foul up to the surface. Ordered the air pump to be laid off and the funnel to be applied as during the turbulent state of the weather which has occasioned this discharge of foulness I think it is better calculated to expel it than the pump. (Buddle, HJ) <u>Sunday 21st May 1815.</u> The Kenton pit vomited a great quantity of foulness through the course of this day... (Buddle, HJ)

Buddle and his men were not about to give up despite the risks. He used the pause to search for ways that water might be getting into the pit and found cracks in the bed of a nearby millstream where water was obviously disappearing underground. The cracks were swiftly plugged with clay, but the progress of the engines was still measured in inches a day.

> <u>Monday 22nd May 1815.</u> Got into face of drift in Kenton Pit at ten o'clock this morning but at twelve o'clock foulness began to come off again and the men could only work at intervals till midnight when they were obliged to leave off. (Buddle, HJ) <u>Wednesday 24th May 1815.</u> Holed through the wall in the face of the drift in Kenton Pit with picks - the holing is apparently into a goaf (old worked out part of the seam) not fallen but nearly close crept. (Buddle, HJ)

> <u>Friday 26th May 1815.</u> Got through the goaf into another coal wall in the Kenton pit... (Buddle, HJ)

Buddle's diary makes light of the problems he and his men faced in Kenton Pit, but it is impossible to exaggerate the risks they faced attempting to reach the trapped men. Coal mining in a working pit was dangerous enough, but opening up dead waste (abandoned coal seams) which had
been left unventilated for years without the furnaces and airways that circulated air throughout the workings was desperately dangerous and one candle or a spark from a steel mill could have meant the rescue attempt ended in disaster. It was a testament to Buddle's skill and judgement that it hadn't so far, but how long could his luck hold? That was the question that haunted him as the rescue effort entered its fourth week. By then his diary was telling a familiar story.

> <u>Saturday 27th May 1815.</u> The men have scarcely been able to get into the face of the drift in the Kenton Pit today on account of the great discharge of foulness from the old waste (Buddle, HJ)

> <u>Sunday 28th may 1815.</u> The men have not been able to get into the face of the drift in the Kenton Pit all night – they got in this morning at eight o'clock. (Buddle, HJ)

> <u>Monday 29th May 1815.</u> Could not keep in the face of the drift <u>Tuesday 30th May 1815.</u> Got into another coal wall in the Kenton Pit (Buddle, HJ)

> <u>Wednesday 31st May 1815.</u> Got through the wall into another board in the Kenton pit. The board is close crept and the wall was seven yards thick I think (Buddle, HJ)

> <u>Friday 2nd June 1815.</u> Have gotten into the fourth coal wall in the Kenton Pit. The workmen still continue to be very much interrupted by the bad air from the waste (Buddle, HJ)

<u>Sunday 4th June 1815.</u> Have been frequently interrupted by bad air during the last two days but have reached the fifth coal wall from the lining mark this morning (Buddle, HJ)

<u>Monday 5th June 1815.</u> Getting very slowly forward with the drifting in Kenton Pit from the foulness coming off. Have gone through another coal wall into an open board out of which the foulness discharges very strongly – it seems to be mostly inflammable air from which I imagine that this opening communicates with the open waste leading to the workings. (Buddle, HJ)

By then a month after the disaster and four weeks into the rescue attempt Buddle believed the way was open to reach the trapped men if anyone could get through the workings and live. It was so near and yet so far, the difference between life and death for the rescuers and the trapped pitmen hung on a thread so it seemed.

> <u>Tuesday 6th June 1815.</u> So much foulness continues to discharge into the drift in the Kenton Pit that the men could not get into the face all this day, I therefore determined to suspend all operations there for a few days to see if the foulness will spend off. In the meantime the air funnel may be applied instead of the air pump which under pressing circumstances is better calculated to lift out the foulness and will save the expense of working the pump. (Buddle, HJ)

<u>Wednesday 7th June 1815.</u> The foulness is standing near to the top of the Kenton Pit, but does not discharge into the air. The people are very impatient at this delay. (Buddle, HJ)

To the desperate people, the families, waiting for news it seemed that the rescue effort had stalled. Buddle had sent the surviving Heaton pitmen to work at Wallsend, a humanitarian move as if they weren't producing coal they weren't paid, and while the pumping continued there were now only two deputies left at the pit. The distressed relatives anger boiled over and as Buddle politely puts it the people were "very impatient" at the delay and both he and they were anxious to make another attempt to break through.

> <u>Thursday 8th June 1815.</u> The Kenton Pit has cleared so much this morning as to allow the people who were in attendance to go to the face of the drift. From this I am inclined to think that we have not got a free communication with the open part of the waste which leads to the workings. I therefore thought it advisable to set the air pump on again and attempt to proceed with the drift. But as the piston of the pump is much worn I ordered it to be renewed with iron – it will not therefore be ready till tomorrow. (Buddle, HJ)

Unfortunately despite all the heroic efforts of Buddle and his men the rescue ended in failure more than a month after it started. It was not the failure he had feared, the loss of many lives in an explosion or a massive outburst of suffocating gas. It was just a gradual recognition that further progress was not possible and the final terrible certainty that the seventy five trapped men and boys were dead.

<u>Friday 9th June 1815.</u> No progress made in the Kenton Pit drift, as the ventilation by the air pump will not clean the drift (Buddle,HJ)

<u>Saturday 10th June 1815.</u> Laid off working the air pump at the Kenton Pit as it could not clean the drift sufficiently to allow the men to get to the face (Buddle, HJ)

<u>Wednesday 14th June 1815.</u> The foulness has discharged strongly from the top of the Kenton Pit today (Buddle, HJ)

Sunday 18th June 1815. Nothing more can be done in the Kenton Pit as the discharge of foulness still continues

So ended one of the greatest mine rescue ever attempted, and even in failure one of John Buddle's finest hours because despite the incredible risk no lives were lost in the deadly Kenton Pit, though he wouldn't have agreed then or later with this assessment... ... and still the pumping continued.

By the end of the summer the end was in sight. On the Seventeenth of September the water in the engine pit was just thirty four feet deep. By the beginning of October it was possible to enter the far pit and start clearing up the devastation. On the twelfth of October the far pit furnace was lit, but there was no celebration. The shadow of the fate of the seventy five men and boys still lingered, in Newcastle people still talked of knocking heard underground and now there were stories of angry ghosts walking the town moor demanding to be rescued and talking about betrayal. It was a terrible time, worse even than the long struggle in Kenton pit, then there was deadly danger but there was also the hope of success, now there was nothing to look forward to except the grim task of recovering the bodies and restoring the pit.

The long pumping effort and failed rescue attempt left the Heaton Colliery Company effectively bankrupt despite a remission of the rent for the colliery by the land owners and the restoration of the colliery was only made possible by an advance of £5,000 to the company by one of the partners Mr Potts. Buddle worked frantically to repair the pit and clear the roadways filled with sludge and rubbish, but behind all the activity there was something else on his mind, he had to know what happened to the men, and if as people said they died agonisingly of starvation and despair waiting for a rescue that never came. By the end of December the water was lapping the roof of the mothergate in the engine pit and the moment of truth had come, the door to what was the tomb of seventy five people would soon be open.

On the 2nd January 1816, eight months after the disaster, they reentered the pit. Buddle led the way and penetrated 90 yards before he was stopped by a fall of rock, but he was able to inspect the stables and found the complete skeletons of two horses. As they penetrated deeper bodies began to be found lying where they fell as they tried to escape the rush of water. First on the 6th January William Stott, and then on the 23rd January as the way was cleared the overman W Miller, and the wastemen Robert Richardson, and Henry Dixon, Buddle carefully recorded all their names and the circumstances in which they were found in his journal. On Wednesday 14th February his worst fears were realised.

> ...this morning we discovered 55 of the bodies ... at Gibson's Crane. They were in two parties nearly of equal size the one in the mothergate adjacent to the 1st holing above the crane the other in the bie way board. They had evidently survived the accident for some time, as they had killed one horse and cut the flesh out of his hams, it had been divided amongst them, but little if any had been eaten as portions of it seemingly the share of individuals was found lying near to the bodies in caps and bags. (Buddle, HJ)

Buddle doesn't say what the people's reaction was to this grim discovery. His own approach was like a detective at the scene of a crime. He wanted to know how long they lived and how they died, more people than ever were saying they had starved to death after many weeks waiting to be rescued. His investigation had already uncovered one small tragedy which confirmed his lifelong belief in the special quality of pitmen. He wrote in his journal:

> ...it is clear that the 4 wastemen and Miller, together with old Gibson had been all together. Robert Richardson as well as

Gibson were feeble old men and it is probable that Miller and the other wastemen had perished in consequence of assisting them out (as) they were all within 100 yards of the shaft. (Buddle,HJ)

On the 23rd February Buddle set down his conclusions in his journal which gave him and the relatives of the victims as much comfort as was possible in the circumstances.

> From general circumstances and appearances I am of the opinion that they had not survived more than 2 or 3 days at most, probably only till the evening of the 5th May when the Moor Pit was found by boring, and a great quantity of gas or air escaped. As it has since been proved that there was a free communication for air between the workings where the bodies were found and the old pit, it is probable that the very act of boring into the pit on the 5th of May put a period to their existence by letting the air which was highly compressed escape. The horse which was found on the 1st board N from the crane had no marks of violence upon him and from every appearance had died of suffocation. On the strictest examination no dung was found near to the horse, nor was any human excrement to be found, both of which circumstances go far to prove that neither the people nor the horse had survived for any length of time. They seemed to have suffered much from

the cold as they had made 4 different cabins or places of shelter with brattices to keep them off the damp thrill. Benches were formed by laying props on the thrill as joists and crossing them with the brattice. The horse in the mothergate had been killed by having his skull knocked in with an axe... (Here follows a description of the butchering of the horse)... The other bucket was standing near and had probably been intended to hold drinking water. The only part of the horse which had been cut was his hams, and little if any at all of it had been used, as to all appearances, the whole quantity which had been cut off was found lying about in pieces. Several candles were also found both in the overman's chest and sticking on the walls, which shows clearly that the sufferers had not died of famine. (Buddle,HJ)

All the men were buried at Wallsend on Thursday 7th March 1816. The funeral was Ann Buddle's first public appearance as she joined her brother to pay her respects to the dead and people noticed they were a couple. By then the criticism of Buddle had abated and people recognised he had done his best, more than anyone expected, to try and save the men. An inquest found as usual that there was no blame attached to owners in any way for the disaster. Whether John Buddle blamed himself is not clear, but he sent the men into the danger area, and he wouldn't have been human if he hadn't felt some responsibility. Almost certainly he felt he did his duty by attempting the rescue and bringing the bodies out and his discovery that they did not linger for weeks in darkness, famine, and despair undoubtedly gave him and the families some comfort.

Buddle was a Unitarian and did not believe in a personal God in the sense that He appeared in the doctrines of the Church of England or the Catholic Church. His diaries do not mention religion except in discussions of church architecture or comments on the quality of the music and singing in services he attended as the guest of others. He seems to have held out no hope of an afterlife even describing the death and burial of his beloved sister Ann, the greatest tragedy of his life, or reflecting on his own mortality after her burial. Unlike the Coroner at the inquest on the Heaton victims Buddle placed no trust in God's mercy or the promise of resurrection. Instead he believed that mining disasters were natural events that could be mitigated if not prevented with proper precautions. All the loss of life was to Buddle unnecessary and after Heaton it was his life's mission to minimize the number of victims of the increasing demand for coal.

For Buddle the lesson of the flooding was clear. The price of pitmen's safety was his knowledge and vigilance. Both had been found wanting. He proposed there should be a central repository where the plans of old mines could be deposited and be easily available for consultation so that miners working near old workings were no longer like blind men groping in the dark for a fire and hoping not to get burned, but would know in what place the danger lay. As for the lost miners their preparations showed they were comradely, organised and disciplined and their end when it came was swift and unexpected while they still mercifully had hope, that was the most Buddle hoped for after the rescue attempt was abandoned. He certainly felt a responsibility for his men: on the day after the flood he took the surviving Heaton shift on at Wallsend as an extra shift and when trade slackened he distributed them among other shifts rather than lay them off, not the action of a man who didn't care.

Tragically is was to be more than a hundred years before a comprehensive central repository of all mine plans was created and in a repeat of the Heaton disaster at Scotswood on the 30th March 1925 in the west end of Newcastle miners at the Montagu View Pit broke through unexpectedly into the abandoned workings of Buddle's old Beaumont Pit at Benwell (then known as the Paradise Colliery) and 38 pitmen died in another disastrous flood. Buddle's meticulous plans of the workings were in the office of a neighbouring colliery, but they were not known to or consulted by the owners of the Montage Colliery when they planned to extend the face near the Paradise barrier. Even more than 100 years after the Heaton disaster knowledge and vigilance had once again been found wanting.

Buddle sold his stake in Heaton Colliery on the 31st December 1821 noting briefly in his journal "having sold my interest in the colliery to Mr Potts, I this day quitted the concern." (Buddle, HJ)

The date is significant, just as at Hebburn he had probably given six months or more notice of his intention to resign as viewer and had given the partners time to replace him. It was more than five years after the disaster and he had moved on to bigger things, he was now the viewer to the Londonderry Collieries and probably did not have the time to devote to Heaton. Perhaps he was also glad to put memories of the 1815 disaster behind him and forget the terrible things he saw when he found the trapped men on the 14th February 1816. He wouldn't have been human if he hadn't.

The Slaughterhouse

In 2008 workers on the new Tyne Tunnel at Jarrow came across old mine workings, the remains of Jarrow Colliery which was abandoned in 1854. The Tunnel workers found the old shaft, the only entrance to miles of tunnels seven hundred feet beneath the three present river crossings extending north across the river to Willington as well as west below the town centre and east below the car and coal terminals of the Port of Tyne which now literally brings coals to Newcastle. I wonder if they realised what they had found. The pit was called the Alfred Pit when it was opened in 1803, but the pitmen of Tyneside had another name for it, they called it the slaughterhouse. More than a hundred and fifty men died in seven explosions at the Alfred Pit in little more than a generation, and Jarrow Colliery claimed more than two hundred lives in its fifty year history, a terrible record for what was a modest colliery employing little more than two hundred people, yet there is also another side to Jarrow's mining history which should be remembered.

If anywhere deserves the distinction of being the birthplace of the miner's safety lamp it is Jarrow. At the beginning of the Nineteenth Century the large rural parish of Jarrow included the colliery villages of Hebburn, Heworth and Felling and it was with the terrible explosion at Felling Colliery which killed 92 men and boys in 1812 that the story of the safety lamp begins. The Reverend John Hodgson, Vicar of Jarrow, later the author of a History of Northumberland, an antiquarian, and an important figure in Newcastle Society, was not content to leave the tragedy unreported except in the obscurity of mining villages and preached a famous sermon demanding that something must be done. That sermon led to the formation of the Sunderland Committee and the invitation to Sir Humphrey Davy, one of the leading scientists of the day to investigate the problem. He came up with the Davy lamp, an oil lamp in which wire gauze protected the naked flame and prevented it from firing the inflammable air in mines. By coincidence George Stephenson quite independently working on the basis of trial and error came up with a similar lamp in which the gauze was protected further by a glass chimney and a notorious controversy was born. Both lamps were tested at Hebburn Colliery on the 9th January 1816, the glass on Stephenson's lamp broke, and the Davy Lamp was declared to be the most practical for use in pits, and within a couple of months it was in general use replacing steel mills in Hebburn, Jarrow, and Wallsend Collieries.

So rests Jarrow's claim to be the birthplace of the safety lamp. In fact John Buddle, then the viewer of Jarrow Colliery, and an acquaintance of Hodgson was behind the Davy lamp. It was Buddle's idea to approach Sir Humphrey Davy, the famous scientist for a solution to the problem, and Buddle worked with Sir Humphrey on the development of the lamp. Of course it was also Buddle who organised the Hebburn Trials, declared Stephenson's lamp impractical and began the famous argument. Buddle was certainly prepared to put his money where his mouth, or more accurately pen was, and pay for the introduction of safety lamps in his pits. It is easy to see why, he knew from his experience the Hebburn fire of 1810 which killed five men that steel mills were not safe and he wanted an alternative.

In the rival claims for credit and reward for the lamp Buddle strongly supported Davy. In Buddle's view Stephenson at best had stumbled on the principle of the lamp by accident while Davy, a scientist had applied science to the problem and come up with a reasoned solution. Davy represented everything that Buddle stood for, science and learning, and he was prepared to minimise his own role in the development of the lamp in deference to Sir Humphrey's professional standing. Buddle is depicted with a Davy lamp and a steel mill in his memorial at Benwell Church so it is clear contemporaries were in no doubt about his role in Sir Humphrey Davy's discovery, but for Buddle it was the process that was important not the person and competing claims for priority in the invention left him anary and bemused. Buddle's deference to authority, some would call it snobbery, also played a part in his public row with Stephenson. The Reverend John Hodgson, a gentleman scholar with wide interests who excavated Housteads Roman Fort and wrote a History of Northumberland was just the sort of man Buddle admired, a gentleman with a conscience, and of course Sir Humphrey Davy, an eminent scientist was at the top of Buddle's pantheon, while Stephenson, an uneducated pitman, a type who he knew well and greatly admired in their place, seemed to be trying to claim credit for himself and acting like as Buddle once called him a knave. That was unfair, Stephenson and his mentor Nicholas Wood perfected their lamp through many trials, but when roused Buddle was not a reasonable man and he objected to what he saw as Stephenson's impertinence, though his relations with Stephenson did improve and he was able to collaborate with him on the design of the suspension for railway wagons in the 1830's

The row over the safety lamp was made worse by the activities of William Martin; the self-styled Newcastle anti-Newtonian Philosopher who was a near neighbour of Buddle's at Willington and who claimed he, Martin, was the real inventor of the safety lamp. Martin, the brother of the famous Newcastle artist John Martin, was to Buddle obviously a man of little wit or understanding, as he claimed to have invented almost as many things as the Marguis of Worcester including inevitably a perpetual motion machine. Martin ran an effective newspaper campaign against Buddle for many years which irritated Buddle immensely. At a time when the colliery death toll was rising rapidly with Buddle at the eye of the storm, Martin called the Davy lamp a "murder" lamp and blamed the Davy for the frequent explosions, a call which was echoed by others who showed the lamp could still ignite gas in a strong current of air. There is no evidence that the lamp caused any of the explosions at Jarrow or Wallsend and plenty to suggest that its effect was minimised by the way hewers worked and were paid. John Buddle was the manager of Jarrow Colliery, the notorious slaughterhouse, from 1811 to 1828 and his diary documents what really happened in great detail. If Buddle was responsible for the introduction of the safety lamp he was also responsible for the terrible slaughter at collieries like Jarrow, but it was the failure to use the lamp to its full potential rather than its introduction which was the cause of the disasters.

Buddle's diary documents the pitmen's struggle for that most basic of human rights, the right to earn your living and provide for your family in what reasonable people would call safety and security. Mining was and is a dangerous occupation, but no one outside of a soldier on the battlefield would accept the level of risk the pitmen of Jarrow were faced with when Buddle sent them to work the Bensham Seam in 1823, almost a fifty per cent chance of being killed in an explosion in less than ten years. Compared with that going to war at sea in Nelson's Navy was a safe activity, and yet even now the Jarrow pitmen's courage is almost unnoticed. There are many heroes and few villains at Jarrow, the main villain being ignorance of the risks that were being taken, and a refusal to accept the full cost of making the pits safe which leaves the owners with no excuse for what happened.

Jarrow was John Buddle's pit from 1811 to 1828; he managed it on behalf of absentee London investors and at Jarrow he was less a traditional viewer and more a modern manager. Buddle had a good record at Benwell, Wallsend, and even fiery Hebburn, but he was literally out of his depth at Jarrow. By 1820 the most accessible coal on Tyneside, the High Main Seam was worked out and at Jarrow Buddle looked to the unexplored Bensham Seam below the High Main to ensure the pit's future, a familiar story in mining at all times and all places. To the east of Jarrow the Bensham Seam was heavily faulted and full of inflammable gas. Buddle and his men blundered into danger at Jarrow just as they had at Heaton and just as disastrously. It was that simple and the solutions, better ventilation, safe lighting, and eternal vigilance were always in sight yet insecure in the demanding environment of a colliery where dozens of lives were always at risk.

Buddle wrote a complete record of his work at Jarrow in his diaries so he could report to the owners in London and almost as a dialogue with himself as he thought through exactly what he was going to do and considered the alternatives. The Jarrow diaries look like a book designed to be read, by whom it is not certain, by his successor Matthias Dunn who took over as viewer as Buddle's increasing commitments to Lord Londonderry and Seaham Harbour made it necessary to devote less time to the pit certainly, and maybe also by his sister Ann who acted as his personal assistant and helped him keep his affairs in order.

Buddle was appointed viewer of Jarrow Colliery on the 13th July 1811. In many ways it was an unusual appointment in an industry where the ownership and management of collieries like Wallsend tended to run in families, Jarrow was one of the enterprises of the bankrupt shipbuilding to coalmining entrepreneur Simon Temple, and it was bought from his trustees by London investors John and Thomas Brown for a song. As one of the few profitable parts of Temple's empire, Jarrow coal was sold on the market as from Temple's *Wallsend* Colliery, it had been worked intensively since its opening on the 23rd September 1803 and by 1811 its reserves in the High Main Seam were almost exhausted except for a heavily faulted area to the east under Jarrow Lake, a large tidal mudflat on the river Tyne. The Brown's undoubtedly hired Buddle for his expertise in robbing the pillars of old workings, and there was also the possibility that his geological and technical knowledge would allow the coal under Jarrow Lake to be exploited. It is not clear how much he was paid or on what basis he was employed, but from the time and energy he devoted the job he might have had a share of the profits or even been a partner in the business or perhaps he was just conscientious in his work. The Browns required occasional reports, but mostly they let Buddle get on with his work and didn't interfere although his diaries show that he was always careful to give them detailed reports and get their approval for his plans.

Jarrow was a moderately sized colliery with a vend of 30,000 chaldrons employing just over 200 men and boys and Buddle certainly didn't disappoint its new owners as he kept the pits production and profitability up by working the pillars and won the coal under the Lake with a stone drift through the faults. Transport underground was always expensive at Jarrow, a single shaft colliery with extensive workings and Buddle built cast iron tramways with stationary steam engines to haul sets of rollies up inclined planes and more than halved the number of horses needed underground, a massive saving which more than justified the capital cost of the system.

Even in 1811 Jarrow was not considered a particularly safe pit, that year twenty five men were injured and one killed by fires caused by oil lamps and candles. Buddle had an immediate impact on safety; he replaced almost 2,000 oil lamps along Jarrow's long roadways with candles giving each rolly (tram) driver their own candle. His reasoning was simple, no one watched the lamps along the roadways and when inflammable gas accumulated the naked flames would fire without warning, rolly drivers could watch their candles and see when gas was present so precautions could be taken and fires avoided. At times of extreme danger he replaced candles with steel mills and ventilated the pit by a waterfall which pushed air down the shaft rather than the furnace which pulled air out from the workings and could fire the gas in the return of the air from the coal face. Jarrow also had its own barometer so extra precautions could be taken in dangerous conditions when air pressure was low and gas tended to come out of pockets in the seam. In 1812 the year after Buddle's arrival no injuries or deaths from fires were recorded, but his extension of the pit's workings into the faulted area under the Lake where dykes could trap bags of foulness was already taking the men into dangerous territory.

Jarrow had only one shaft to ventilate its extensive workings which included a mile long tunnel under the river Tyne to the Corporation workings at Willington unlike Wallsend or Hebburn which had multiple shafts. This made the ventilation at Jarrow inadequate, at Wallsend and Hebburn there were many different ways Buddle could change the air course, but at Jarrow his options were limited and a big escape of gas could easily overpower the airflow and create a dangerous explosive mixture of air and gas. We would say now it was madness to work Jarrow with just one shaft, but for the owners the cost of sinking a second shaft, up the thirty thousand pounds, made it out of the question. Buddle wasn't employed to close the colliery, his job was to work it profitably, and spending thirty thousand pounds on a pit which made £4,800 profit in 1814 rising to £6562 in 1817 without producing a single extra chaldron of coal didn't make sense to anybody. He tried instead to make the best of the situation by dividing the Jarrow shaft into four sections with brattices so that it acted like four shafts, two upcast which pulled air out of the pit with the aid of furnaces and two downcast which drew fresh air into the pit, but it was never enough and in a gassy pit like Jarrow fires were inevitable.

> <u>Thursday 25th September 1817.</u> A fire took place at 2 o'clock this morning in the Rawlan Hill District from the following course. The air in the working judds falling slack, and the innermost one fouling, Wilkinson the deputy was proceeding to tighten the door at the head of the sheth (suspecting that it was leaking) knowing that the upper path of the goaf was foul he very properly took his lamp, at the same time some stones having been thrown into the board which obstructed the air. He set Sam. Hood to work to remove them and from this being the air board, allowed him to work with his candle, he had been a very little time at work

when his candle was fired on from the foulness tailing back from the goaf with which it immediately communicated and produced a very heavy explosion extending for 10 boards west burning every person in the headways and the judds. Thomas Fenwick and another were hewing in the mothergate board which is five and a half pillars up and they saw the fire advance within a few yards of them, but their candle being left burning they came out and in spite of the afterdamp (poisonous carbon monoxide) which was very strong they searched along the headways and found Wilkinson and the others, some of them going inby again whom they brought out. Help being had the reminder were all recovered alive but one trapper, Brown, was only found at the foot of the goaves at five o'clock in a state of insensibility and much burnt. (Buddle, JJ)

The casual bravery of Thomas Fenwick who saw the fire and knew the dangers of afterdamp but went back into the danger area to bring others out was remarkable. Wilkinson's error in letting Hood use his candle cost them both their lives. They had Davy Lamps but didn't use them as candles were still the normal means of lighting in "safe" areas of the pit. The problem with the Davy's was their faint light, the men couldn't see to work, and unless there was an obvious danger they wouldn't use them. It was a problem that would cost many lives at Jarrow and on this occasion great suffering. Buddle recorded in his journal that the fire did "no material injury" to the pit, but lists six of the men burnt in the fire of the 25th as dying of their injuries, the first being William Wilkinson who died at 3 am on the 27th of September, Samuel Hood died later the same day, James Brown died on the 7th October, James Liddle died on the 10th October, William Stanley died on the 20th October, and the last Thomas Hope died on the 12th November. It is impossible to imagine the suffering of these poor souls severely burnt in an age without pain killers or the chance of relief and lingering on for days or even weeks in agony until the end finally came. The youngest James Brown was only ten years old, and he suffered for almost two weeks, a terrible fate for a child.

Davy Lamps were in general use at Jarrow at the time of the disaster. In fact they had been introduced by Buddle in March 1816 shortly after the Hebburn trials; they were used to check for gas before work started and by deputies and wastemen in dangerous places. On the 20th November 1816 a hewer and a deputy were dismissed for unscrewing the tops of their lamps in an "improper place", but Davys were not generally used for hewing. The Davys dim light made it impossible for hewers to separate or sort coal from stone so candles were normally used except at times of known danger when they replaced steel mills. Some or all of the Jarrow disasters would have been avoided if the system of sorting coal had been changed and it was allowed to be sorted at the surface as it was for a time after the 1830 disaster. Buddle's response to the 1817 fire at Jarrow was as at Hebburn to urge his men to be vigilant. Furnace keepers were warned to watch the return of the air at their furnaces, a change in the colour of the flame was a sure indication of gas in the workings, hewers entering their boards were instructed to always check for gas with their Davys before starting work, and at times of risk no candles would be used, the pit furnaces would be put out, and a waterfall used for ventilation in their place. On occasions, especially when the barometer was low, the pit would be laid off because the risk was just too great, but the main risk was a sudden and unexpected discharge of gas from a pocket in the coal without warning and Jarrow's ventilation was never secure.

> Monday 19th June 1820. About two o'clock this afternoon a very alarming circumstance occurred. The west pit furnace suddenly drew down, that is the pit cast down (all the smoke and fumes from the furnace went into the pit instead of drawing air up the shaft and out of the pit), Alexander Hall immediately went down, and found the smoke and air pressing with such force against and through the double doors in the North headways, that it was with difficulty they could be held shut. He was at a loss to imagine what could occasion such a retrograde movement in the air, but immediately threw some of the main doors on the east side of the north headways which bear the engine pits air into Broke and the Corporation (districts). The had the effect of

immediately opening the west pit furnace which from the change made a safe way drawing the deep pits air to cast up again, and all matters apparently assumed a favourable appearance. After a while he thought he would look at the dumb pit furnace to see how the return of the Corporation air looked. On going between the two main doors which separated the two furnaces, the foulness caught his candle and nearly exploded before he could put it out. He then opened the other door to look at the furnace, when he saw the return air all in a blaze at the furnace, and according to every appearance on the very point of exploding. He instantly gave the alarm and all the people began to ride away (up the shaft) immediately. John Johnson, Robert Rankin, Thomas Potts and the furnace keeper remained with Alexander Hall while the people were getting to bank, and so desperate was the state of affairs that they gave themselves up for lost, and took their leave of each other. After a little while Alexander Hall determined to make an effort to avert the catastrophe which menaced them. He therefore set the Broke bearing doors quite open, and ran up the crossing which carried the return air from the Corporation over the west mothergate to the dumb pit furnace, and with all expedition broke a hole through the crossing. By this measure the air was both at once taken off the Corporation and the whole current of fresh air thrown between the body of foulness and the furnace. It succeeded and the danger immediately ceased. In the meantime all the people were got to bank at the pit with all dispatch, and the furnaces were put out till matters could be put to rights again. (Buddle, JJ)

Jarrow only had one shaft. There was a full shift down the pit and the men couldn't possibly have got out in time riding a handful at a time on a corf. If the furnaces at the bottom of the shaft had exploded the shaft would have been blocked and all the men and boys in the pit would have died, some from the explosion and the rest from suffocation as the vital airflow down the shaft was cut off. Buddle knew how close Jarrow was to disaster on the 19th June 1820 and wrote in his diary "too much praise cannot be bestowed on Alexander Hall for his meritorious conduct on this occasion" but the pit didn't stop working which was the only way it could ever be safe. Jarrow had many more near escapes and close calls over the years, all recorded in Buddle's Jarrow diary, but none where the consequences could have been so disastrous. When the furnace at Wallsend B pit fired in similar circumstances in 1835 101 men and boys lost their lives, at Jarrow in 1820 but for Mr Hall the death toll would have been just as great.

On the 8th September 1821 Buddle found the Bensham Seam by borings at a depth of 175 fathoms (1050 feet), confirming the sequence of seams he noticed at Benwell and giving Jarrow Colliery a new lease of life. This was the time a new shaft could and should have been sunk; the Bensham Seam was unexplored and was certain to be full of gas, but to save costs the owners decided to win the seam by sinking a staple (an underground shaft which did not reach the surface) from the High Main workings. The cost was £3000, a paltry sum which could easily be met from the annual profits of the Colliery which made £4,289 in 1822 after the cost of the staple was deducted and £8,533 in 1823 the year the Bensham seam was won. It's not clear whether Buddle ever recommended a second shaft for Jarrow, but it's unlikely that he did, perhaps complacently he thought he could manage safety at Jarrow, but he was wrong and it cost many of his pitmen their lives.

On the 17th January 1826, shortly after the pit returned to work after a long and bitter strike 34 men and boys were killed by an explosion in the Bensham seam.

<u>Tuesday 17th January 1826.</u> The Bensham Seam exploded about half past seven this morning, the report and shock were distinctly felt at band (at the surface).

Ra. Coxon went down the east pit on the first alarm into "the seam" (High Main Seam) to the top of the Bensham Pit, where he met Wm. Tate, one of the Bensham pit deputies who had just come up the Bensham pit. Tate said that much damage was done, but that Robert Rankin the overman was safe, and that he was collecting all the people he could find alive at the bottom of the east pit shaft where a strong current of air was coming down, in consequence of the scaffold at the stone drift having been blown out.

Tate further stated that Rankin was endeavouring to put a hay stopping into the barrier wall, out of which the stable doors had been blown, with the intention of throwing the air into the north way as far as possible, to relieve those who might happen to be alive in that quarter. This operation of course forced the afterdamp (poisonous carbon monoxide) up the Bensham pit.

On this account Coxon was not able to go down the Bensham pit, he therefore got the east pit rope lengthened with all speed, and went down that shaft to the Bensham Seam, accompanied by 3 or 4 coal hewers and Alexander Hall.

They found several boys at the bottom, burnt and maimed, and sent them to bank (the surface). They then proceeded to replace the stoppings along the north headway in the best way they could, and by this means were enabled to reach the face of the north winning boards where they found the bodies of a man and a boy most terribly burnt.

They then proceeded a pill up the innermost west board, and went into the board, where they found 3 dead bodies which were not burnt.

Not being able to proceed further they went back to the east pit shaft and begun to make the stoppings good with deals (wood)

and lime, all idea of saving lives by further exertion inby being then given up. In the meantime Mr Dunn arrived and the Bensham engine fire and furnace were put out.

The afterdamp was now discharging fully up the Bensham pit, into the stone drift and through the stables where it killed all the horses (44) except six, and it was so strong at the top of the Bensham pit that nobody could live there.

The tracing of the air through the Bensham Seam, and the getting of the dead bodies, was then continued until the whole

34 in number were found, on the evening of the 18th. (Buddle, JJ)

One popular account of the explosion comments that the owners cared more about the horses that died in the explosion than the men. Buddle's account makes clear that was not the case, the horses died because of the efforts made to secure the ventilation of the pit and save the survivors, none died in the explosion itself. Looking back at the explosion he was full of praise for his men who undoubtedly saved many lives and for one man in particular who lost his own life while saving others.

> At the time the explosion took place Robert Rankin the overman, with William Tate and William Burn, deputies were taking down stone for lengthening the rolley way in the south side workings. They were thrown down by the wind of the explosion, but they were not materially injured, and reached the bottom of the east pit, in safety bringing some boys who had

escaped out of the east way with them. The engine man at the top of the Bensham pit behaved remarkably well, as he remained at his post, drawing and letting down the people, until he fell from the effects of the afterdamp. Indeed every person concerned behaved as well as possible, and exerted themselves to the utmost. (Buddle, JJ)

Buddle set about repairing the damage to the pit and by the end of January it was ready to return to work, but the men refused to go underground. He noted ambiguously in his journal that he had investigated the cause of the explosion and found no obvious fault in the air course commenting that the location of the fire showed no indication that the waste had become foul. The men believed that a recent change in the air course had caused the explosion and refused to work until there was an independent investigation. It is likely that Buddle already knew the cause, but was reluctant to put it to the men and he allowed them to appoint their own viewer as they requested.

> <u>February 2nd 1826.</u> The men having fixed on A. Hall to investigate the above matter, he examined the circumstances of the catastrophe and was accompanied in his view of the workings by 4 of the men. He reported decidedly against the accident having been occasioned by the placing of the stoppings, as above stated (the men's belief was that it was caused by a fault in the air course), but was of the opinion that it had been

caused by the innermost north west working place getting foul, from the neglect of the first north west cram board main door. The men who accompanied him concurred in this opinion and the question was set completely at rest. (Buddle, JJ)

In plain words the disaster happened because an unfortunate child left a door open. On such slender shoulders did the lives of thirty four men and boys rest? Buddle could not blame a child who died in the explosion for the disaster so he let the men find it out for themselves what happened. It was not a cynical ploy, Buddle felt deeply for the men and boys who had been killed and was one of the largest contributors to the relief fund which raised over £600 for the widows and orphans; it was I think he believed the right way to handle a difficult situation.

The men returned to work and the colliery returned to production. Hall's report had not of course found that Jarrow colliery was safe, but rather demonstrated that the pits safety and the lives of its men hung by a thread that could easily be broken by the smallest of omissions by the least of its workers. Buddle's cold forensic conclusion to his investigation was that there would always be a risk of further disasters, but the pit was not closed, in his view the risk could be managed, but he was wrong and once again his reluctance to admit that Jarrow was a death trap cost many men their lives. Davy lamps were not being used in the workings at the time of the disaster as there was no indication of foulness and the gas was fired by a candle. At Jarrow there was always the risk of gas, and in hindsight we would have to say at Jarrow candles were never safe, but in 1826 that was a step too far even for the pitmen themselves. Buddle was justifiably proud of his men's bravery in the rescuing the victims of the explosion and once again urged vigilance, but it was not enough, and on the 15thMarch 1828 there was another explosion.

> <u>March 15th 1828.</u> The overmen, deputies and shifters were employed this morning in laying the rollyway through the split wall at the foot of the crosscut, and in making the brattices good in the workings when an explosion took place, supposed at the 1st north holing in the cross cut which together with the two adjoining boards had been stowed up (filled up with rock to support the roof) for five or six months... (there follows list of people in the pit, of the 19 underground five were killed by the fire and three suffocated) ...The crossing in the north east cross cut was blown out, which cut off the air way at (that) place and caused the people to be suffocated. The fire happened at about 4 o'clock am and all the people and dead bodies were all got out by six. (Buddle, JJ)

The death toll could have been a lot worse. Nine people had a very narrow escape.

Johnson the overman and the people with him in the North West way scarcely felt the shock of the explosion. The concussion of the air was so slight so as not to extinguish his Davys. He attempted to get out both round by the north east and (the) south west face of the workings, but fell in with the after damp both ways, and was obliged to retreat into the north west places whose air was good although the current was cut off. He remained here about an hour when the afterdamp began to adulterate the air and considering that the people would be endeavouring to force the air in to them and with it the afterdamp he resolved to make a desperate effort to get out with his party, and with great difficulty succeeded, with the loss of M Whitfield. (Buddle, JJ)

Buddle wrote later on March 22nd:

There can be no doubt that the fire on the 15th March was occasioned by a quantity of foulness having been lodged in the stowed places, which oozing out at the pillaring in the end of the holing into the cross cut fired at the candles of the men who were working at the rollyway although they were in the main course in the first of the air. (Buddle, JJ)

He had already given instructions that Davys were to be used exclusively in the return of the air but this fire happened in the first of the air, the fresh air from the shaft, a clear indication that the ventilation was inadequate. Safety at Jarrow despite all Buddle's expertise was out of control and once again the pit had a narrow escape from disaster a few days after the explosion. <u>March 26th 1828.</u> A bag of foulness broke down from the roof with a feeder of water in the sixth board north from the North West cross cut which immediately adulterated the air course and fouled all the places on the inby side of it. This was providentially discovered in time to prevent an explosion by Mr Tate the deputy, the pit was immediately laid off. If an explosion had taken place on this occasion it would have been a most fatal one. (Buddle, JJ)

By then the strain was becoming too much for Buddle. After the disaster at Heaton he was under extreme pressure, but then there was the rescue attempt to lead, the pumping to manage, and finally the pit to restore. Buddle thrived on activity, but Jarrow was different, at Jarrow there was only so much he could do, and it seemed that he was always waiting for more bad news. Even with the support of Ann, who always appeared at his side at the funerals it was more than he could bear, and he had the first of a number of spasms or breakdowns that dogged the second half of his life. Buddle's entries in the Jarrow journal stop abruptly on the 4th July 1828 with no explanation. He certainly did not resign as he did at Hebburn, he retained a role at Jarrow overseeing the pit as a conventional viewer until 1832, but after 1828 the diary was continued by Matthias Dunn who lived near the colliery at Jarrow House. After 4th July it is Dunn's writing which appears in the Jarrow diary in place of Buddle's as though he was acting for his close friend and colleague who was incapacitated, but it was not the

end of the Jarrow explosions. On the 3rd August 1830 a pocket of inflammable gas burst out of the Bensham Seam, ignited at a candle, and 42 men and boys died in the subsequent explosion. The men, by now fearing for their lives, refused to fire shots or work without Davys. Dunn initially refused their demands and the men appealed to Gateshead Magistrates for a ruling. The magistrates refused to rule saying the matter was outside of their jurisdiction, but later Dunn later agreed to the men's demands as the only way to get the pit back to work and allowed coal to be sorted at the surface, with only Davys being used in the workings. How long this arrangement lasted is not known because the journal ends rather abruptly shortly afterwards probably due to the great miner's strike which was to have such disastrous consequences at Jarrow.

By 1830 Buddle had recovered enough to deliver a lecture on the causes of the 1830 disaster to the Natural History Society at Newcastle on the 18th October 1830. By then he was beginning to be immersed in Lord Londonderry's project to build the new port of Seaham Harbour on the Durham Coast. The harbour didn't carry the same pressures as Jarrow, lives were not at risk, and Buddle felt able to view the disaster with almost academic detachment. His conclusions delivered to a learned group of gentlemen in a comfortable hall were unconvincing given the history and reputation of Jarrow Colliery. If he had not been prepared to risk his own life for the safety of the pitmen who worked for him some would have said he showed a disregard for his men's lives, but Buddle was well aware of the risks his men faced and was prepared to face them himself. The tragedy was they were unnecessary and the solution, the safety lamp, was literally in his own hands.

> It will be observed that the immediate cause of this explosion was the ignition of the gas at the flame of some of the candles used by the workmen, as candles were generally used in this part of the colliery. Here the question, why were candles used at all and why was not the safety lamp exclusively adopted suggests itself? The reason why the safety lamp was not generally used in future, is, that the use of gunpowder in working the coal is guite indispensable, and, as the inflammable air ignites at the explosion of gunpowder, our main dependence must, in all cases, rest on the efficiency of the ventilation. Without the use of this powerful auxiliary, it is not practicable to work the coals out of this part of the mine in a marketable state. nor at a price that would pay for the working. Many collieries are similarly circumstanced, and a certain degree of risk must, therefore, be unavoidably incurred or they must cease to be worked. By proper precautions in firing the shots, and the occasional use of the safety lamp, the degree of risk may be greatly lessened. As it is only in such cases as this, now under our consideration, that any material risk of explosion can arise, and even this risk may be obviated by due vigilance and

attention on the part of the colliers and of those in whose care they are committed. (Buddle, JJ)

Gunpowder was used to loosen the coal which the hewers sorted and sent to the surface in corfs. Hewers were paid for the coal they produced and fined for any stone in their corfs. The Bensham Seam was split by a band of jet and in the dim light of a safety lamp it was impossible to separate the coal from the jet so the men were reluctant to use them. The use of gunpowder did ignite gas in the coal and frighten the men, but none of the explosions at Jarrow were caused by gunpowder. They were all caused by candles and the explosions could have been avoided if the piecework system had been permanently changed, as it was for a time after 1830, but politically from the owners point of view facing repeated challenges from the hewers union this was unacceptable and despite the bitter strikes there was nothing the pitmen could do about it.

Buddle's account of the causes of the explosion was less than complete. Even though he gives a complete geological account of the background to the explosion, and the problems of working in the faulted Lake area where gas accumulated because of the dykes, he does not mention the limitations of the ventilation at Jarrow, a single shaft colliery, in which for all his due vigilance and attention he was unable to prevent three explosions costing the lives of 84 men and boys (at least half of the pits underground workforce) in less than five years. I would have liked to have been there to ask him why knowing the dangers of the pit a second shaft
was not sunk from the surface to the Bensham Seam in 1822. I suspect he would have replied as above that it was not economic for the owners, but in terms of the lives lost and the value of the coal won over the life of the pit that argument just isn't good enough.

Buddle concluded his lecture by suggesting that there should be a "permanent fund for the sufferers arising from the casualties' incidental to coal mining". More than six hundred pounds was raised for a fund for the widows and orphans of Jarrow and Buddle himself was a generous supporter of such good causes, but no matter how much was raised it could never be enough to compensate for the loss of a lifetimes earnings, let alone the distress and suffering which the frequent disasters caused. The Reverend John Hodgson's call that something must be done must have seemed hollow in the light of the Jarrow explosions that happened literally on the doorstep of what had once been his church. If Buddle ever needed a reminder that this wasn't good enough the great disaster at Wallsend literally on his doorstep was a salutary lesson and yet another opportunity for him to show that his heart was with his men even if his head, his mathematics was with the owners.

> <u>Thursday 18th June 1835.</u> On my way from Seaham to Pensher received a message to inform me that a great accident had happened at Wallsend. Hastened then there found the B pit had blasted, 30 fathoms of brattice blown out of the shaft, and the pit choked up at the top of the tubs at the main coal. No access

could be had here, and no person had escaped from the workings. It was but too clear that all had perished. Devised measures for searching for the people. Tried to enter the workings by the C pit but could only proceed a short distance down the east mothergate the stoppings on both sides being blown out, or damaged. (Buddle, PB)

Buddle was now sixty two, but it is clear from his attempt to enter the workings he had lost none of his vigour or courage in the twenty years since he led the rescue attempt at Heaton. Ann Buddle played as the part of the dutiful wife, ministering the injured at Wallsend House and cementing her reputation with the pitmen so that when she died just six years later they formed a guard of honour at her funeral.

> <u>Friday June 19th 1835.</u> Continued repairing the stoppings... During last night and this day got into the far north west or Wallsend division of the workings and found 24 of the dead bodies, 9 of which were burnt. The rest had been killed or died of suffocation. (Buddle, PB)

On the third day after the disaster Buddle, who never gave up the search for the living and dead after an explosion, found three men and a boy alive in the pit, it was a miracle, but from the bodies it was also clear that there were many others, John Lawson and his party of seventeen especially for whom he came too late. Saturday June 20th 1835. During the day got 35 more dead bodies out at the C pit. About 9 o'clock in the evening succeeded in getting down the G pit, west shaft, and found J Reed, John Brown (Onsetter) Robert Moralee and Martin Delap driver boy, all alive, and sensible near the bottom of the pit. Reed and Moralee, the latter kept a door and the former cleaned the rolly way near the shaft and the boy was with his horse in a siding just west from the shaft. They were so exhausted and weak, that I did not think it prudent to question them much. They were all burnt and maimed, less, or more, and one of Reed's legs was so badly fractured that it was obliged to be immediately amputated above the knee. The boy was strongest, but was slightly delirious. Got 11 dead bodies out of the G pit making 67 in all. (Buddle, PB)

<u>Sunday June 21st 1835.</u> Got 9 more dead bodies out of the C pit and suspended operations to get the water drawn out of the sump. (Buddle, PB)

<u>Monday June 22nd 1835.</u> During last night and this morning got 8 pillars down the G pit east mothergate and there found the bodies of John Lawson the deputy overman and 17 others, mostly young men and boys. They were not at all burnt. It was clear the Lawson had collected them all together, and was

bringing them out in a body. These made the number got up this evening 84. (Buddle, PB)

<u>Tuesday June 23rd 1835.</u> Got into the east narrow boards in the G pit 1st west way and found 12 dead bodies making 96 in all. (Buddle, PB)

<u>Thursday June 25th 1835.</u> In the course of this day got 4 more of the dead bodies, being all but one (now found), a trapper belonging to Heppell who is covered by a fall in the east narrow boards of the 1st west way G pit. Occupied all day in ridding out the bottom of the G pit, to get the carcases of the horses out, as they are so offensive that the men cannot work for the stench. (Buddle, PB)

One hundred and one men and boys died in the disaster and one hundred bodies were recovered. The people who died were mostly not hewers (diggers of coal); they were overwhelmingly the people who supported them moving coal underground. Buddle lists them all, many just boys, in a melancholy snapshot of the different trades in the pit: 2 Overmen, 2 Deputies, 1 Onsetter, 6 Hewers, 2 Shifters, 3 Trappers old men, 12 Trappers boys, 3 Cranemen, 44 Putters, 13 Drivers, 4 Helping up, 4 Stone loading, 5 Tramway cleaners, 101 in total. As a man who understood pitmen he continued to search for the body of the boy who he would not lightly abandon alone underground dead or alive, but to the sorrow of his parents, his body was never found and he remains to this day buried in the pit. <u>Friday and Saturday June 26th and 27th1835</u>. Occupied these two days in searching for the body of Heppell's boy, but without success and his parents gave up the idea of (a) further search. (Buddle, PB)

Once again John and Ann Buddle found themselves at a funeral for the victims of a mining disaster this time one very close to home. Buddle was by now a national figure and he gave another lecture to the Natural History Society at Newcastle on a mining disaster, this time at Wallsend, and gave evidence to the House of Commons, but his conclusions were still the same. There would always be risks in mining, but they could be mitigated by proper vigilance and his was a message of optimism not blame or regulation which would restrict the freedom of owners to run their pits and the freedom of pitmen to die.

> <u>Sunday June 28th 1835.</u> Attended at Wallsend Church. Mr Armstrong preached a funeral sermon for the relatives of the suffering. Started by the mail from Newcastle in the evening for London to give evidence before John Peel's committee of the House of Commons... (Buddle, PB)

Buddle doesn't comment on the cause of the disaster in his diary. From the damage to the B pit it was probably caused by the return of the air firing at the B pit furnace. Most of the men and boys who died were not killed by the explosion; with the shaft blocked and the air circulation stopped they were suffocated before they could escape from one of the other shafts of the colliery. The explosion once again brought the best out of Buddle, his courage led to the three survivors being found, and his humanity in searching for the body of the lost boy who was never found. It is however his energy which is most striking, after eleven days at the shattered colliery searching for survivors and bringing out bodies he went straight to give evidence to a Commons Committee in London. He wasn't ready for retirement just yet, but he was now an elder statesman, and his main focus was no longer on Wallsend.

The Browns sold Jarrow Colliery sometime after 1836 and a new owner Drewitt Brown took over the now dilapidated Jarrow pit. Buddle acting this time as a consultant advised on the restoration of the shaft this time with three divisions for ventilation and the pit was working again on the 31st December 1838 with the Corporation District across the river in Willington abandoned. Jarrow remained a dangerous place and on the 21st August 1845 another explosion killed thirty nine men and boys. This explosion which killed many older men with large families received lots of publicity and an appeal which included an art exhibition and a concert raised over one thousand seven hundred pounds for the latest widows and orphans of Jarrow. In 1854 Jarrow colliery was flooded when the general inundation of the mid Tyne coal basin from abandoned workings which Buddle had feared in 1808 finally took place. A consortium of coal owners had subsidised the operation of a large pumping engine at Friars Goose Gateshead for many years to keep the water in the High Main Seam down, but in 1851 the subsidy

was withdrawn and within a few years all the collieries including Hebburn and Wallsend were drowned out. They reopened, but Jarrow never did, and to many that was a blessing.

The operation of collieries with a single shaft was prohibited as a result of the Hartley Colliery disaster in 1862 in which 202 men died after the beam of the pit engine broke and blocked the single shaft of the colliery. The South Shields Committee into Accidents in Mines had said that all collieries must have two shafts in 1843, but its report though praised was never implemented, and as usual when action was taken it was only after a further disaster.

The Jarrow Gibbet

On the third of August 1832 William Jobling was publically hanged on the steps of the courthouse at Durham. His body hung for an hour and then it was taken down, coated, with tar, put in an iron cage, and taken by a party of troops to Jarrow where it was hung on a gibbet overlooking the colliery village as an example to others. Jobling a Jarrow miner and a married man with two children and a heavily pregnant wife was literally executed for doing nothing. On Monday the eleventh of June Nicholas Fairles, an elderly magistrate was riding from South Shields to Jarrow to deal with yet another dispute at the colliery which was in the middle of a bitter strike when at between five and six in the afternoon he was accosted by Ralph Armstrong a Jarrow miner who knocked him from his horse and beat him. Fairles died later that evening at Jarrow, and with his dying breath he blamed Jobling for not helping him when he was attacked. Jobling was known to Fairles, his wife had been the magistrates' servant, and on the basis of that slender evidence Jobling was arrested, tried with indecent haste, and executed. Jobling was the last person in Britain to be gibbeted, a barbaric practice made worse by the fact that by any reasonable assessment of the evidence he was an innocent man.

Jobling was certainly present at the assault as were others, but there was no doubt that Ralph Armstrong committed the crime. The problem was that Armstrong, a former merchant seaman with friends on ships, had fled the country and couldn't be found; the authorities in the middle of a coalfield wide strike wanted to make an example of someone for the sake of public order after the death of a magistrate, and the only person available was Jobling. Jobling was convicted under the law of "common purpose", the idea that even though he didn't actually commit the crime himself he acted in consort with Armstrong and had the same intentions, certainly not the same as doing nothing. The only possible justification for the idea of common purpose was that Jobling was a miner, and so must have been guilty because the murder was connected with the miners' strike, but even by the standards of the time that was flimsy logic, although in this case justice wasn't important, it was the need to make an example of someone that mattered.

Jobling's body hung on the gibbet at Jarrow from the sixth of August to the thirty first of August. At the end of August the soldiers left and the body was cut down and secretly buried at Jarrow Lake near what is now Bede's World's Museum. Ralph Armstrong was never caught and accounts of Jobling's trial and execution suggest that many people had nothing but sympathy for the Jarrow Pitman who paid the ultimate price for the coal owner's fear of the miners. Perhaps they would have had even more sympathy had they known that Jobling had survived five explosions at Jarrow Colliery only to die for a crime he did not commit.

The facts of Fairles's death are nowhere near as clear cut as Jobling's conviction suggests. Ralph Armstrong was a union man who had been taken to court and sent to prison by John Buddle during the 1825 strike at Jarrow. Nicholas Fairles acted as a mediator on behalf of the men during the strike and got the prisoners released from prison when it was settled so Armstrong knew Fairles and had reason to be grateful to him. The incident which led to Fairles's death certainly began with Armstrong who was drunk asking Fairles for money and there is no reason to suppose that the attack was anything more than a drunken scuffle that got out of hand when Armstrong reacted violently to Fairles's refusal. The Jarrow gibbet was a symbol of the breakdown of relations between pitmen and masters in the coalfield and of the loss of something that John Buddle valued most, the trust of his men. It is said Pitmen at Wallsend hanged an effigy of Buddle outside Wallsend house during the strike and Buddle had a serious breakdown which he only recovered from slowly with the support of his sister Ann and the rediscovery of his old love for music. Perhaps loss of trust is an exaggeration because the reaction of pitmen to Ann Buddle's death in 1841 and to Buddle's own death in 1843 suggests that respect and even affection were still there, but the early thirties were a desperate time when in the aftermath of the explosions at Jarrow Buddle's whole world seemed to be falling apart and for a time his diaries are uncharacteristically silent about what was happening.

Industrial relations in the pits at the beginning of the Nineteenth Century depended on a shifting balance of power between the hewers and the owners. On the face of it the system was almost feudal as pitmen were bound to work at a colliery for a year at the annual binding, but the hewers who actually produced the coal could often extract better prices from the owners by refusing to bind and holding out for a few days when coal was in short supply. Traditionally when disputes arose over measures, fines or safety the hewers who were confident and powerful went to the magistrates who generally tried to mediate. The system depended on both sides willingness to compromise and when it broke down because of the owners' attempts to seize the initiative from the hewers at the binding long and bitter disputes were the result.

The binding strike of 1810 shows what went wrong. In 1809 the owners changed the date of the annual binding from October to January without consulting the hewers. The change was to their advantage: in October when the winter demand for coal was at its height the men could sometimes get more by holding out for a few days while in January when demand was slack the coal owners could afford to wait so the men were much weaker. In 1810 an informal combination of men (combinations were illegal) called a general strike in the coal mines to resist the change. Buddle's response was to try and break the strike with the full force of the law and arms and he recorded the events at Wallsend in his journal as follows:

> <u>Thursday 25th October 1810.</u> The Willington, Percy Main Collingwood Main etc. men laid our pits off this afternoon, as they had stopped to compel the owners to change the time of binding from the 21st January to the 21st October. (Buddle, WJ) <u>Saturday 27th October 1810.</u> The men still continue idle.

<u>Monday 29th October 1810.</u> The pitmen still continue idle but we got the pits to work with the shifters, deputies etc. (Buddle, WJ) <u>Tuesday 30th October 1810.</u> The pitmen laid the pits idle this morning. Took up the under mentioned men (5), and got them committed to the house of correction at Morpeth...the men are exceedingly turbulent this evening. (Buddle, WJ)

<u>Wednesday 31st October 1810.</u> The men would not suffer the shifters to work this morning and continued to be exceedingly turbulent. (Buddle, WJ)

<u>Thursday 1st November 1810.</u> The pitmen were exceedingly turbulent this morning in consequence of which Messrs' Scott and Wright accompanied with a troop of the 4th Dragoon guards came to the Colliery and ordered the men to disperse, otherwise they would read the riot act, and they might abide by the consequence. This had the desired effect and they dispersed accordingly. The magistrates further assured them that if they assembled tomorrow they would come and read the riot act without further delay. A number of special constables were sworn, and patrolled the place during the night to keep the peace. Six dragoon guards were quartered at this Colliery, at Bigges Main, and at Bells and Browns Wallsend. Waited upon General Dundass in the evening when he ordered a Corporal and six dragoons to Heaton Colliery, and a sergeant and a company of twelve men to Benton. (Buddle, WJ)

<u>Friday 9th November 1810.</u> After continuing very turbulent all the fore part of the week, our pitmen agreed immediately to go to work this morning. All the Collieries in the neighbourhood with the exception of Heaton continued idle. (Buddle, WJ)

So after more than two weeks the strike was broken at Wallsend. Buddle was probably pleased that the men at Wallsend and Heaton were the first to go back to work. Hebburn held out for a little longer but returned long before the strike was formally settled on the 3rd January 1811.

> <u>Hebburn Colliery Friday 23rd November 1810.</u> The pitmen returned to work again this afternoon, on condition of the prisoners being released, and the penalties for laying idle returned. (Buddle, HM)

The magistrates who negotiated the settlement were clearly worried by the general disorder and ruled that in future the binding date should be neither October nor January but April, an attempt at compromise certainly, but one which still very much favoured the coal owners. In these disputes most of the colliery trades were essentially spectators although they were of course laid off when the hewers refused to bind and no coal was produced.

After 1810 there were no more general strikes for a generation, but Buddle faced a serious dispute at Jarrow over the measurement of corfs which was more like a modern strike and his actions showed that neither his views nor his resolve to break combinations of pitmen had weakened since 1810. The hewers struck over what might seem now to be an almost academic dispute over definitions, but was really a question of rates for piecework: Jarrow had new 20 peck corfs (a peck was a measurement of volume equal to about 40 gallons) on its rollyways and in settling rates for the Hewers who were paid by the quart the owners said there were 18 pecks to the quart while the men claimed there were just sixteen. Buddle's journal allows us to follow the course of the dispute which pitted a determined combination of hewers supported by strike pay against a powerful combination of employers determined to use every means possible to break the strike. Buddle certainly regarded the union men as the enemy corrupting and intimidating honest pitman, but the organisation and unity of the men was certainly took him by surprise.

July 11th 1825. At the colliery the men very much dissatisfied about the size of the corfs. (Buddle, JJ)

The hewers appealed to Gateshead Magistrates for a ruling in the traditional manner and when the Magistrates ruled in favour of the owners there were demonstrations at the pit. Buddle responded by sending six men to appear before the magistrates for their "riotous conduct" and in an attempt at a compromise five apologised and one was sent for trial at Durham Sessions. This was the usual way disputes were settled, but this time the men refused to back down. <u>August 8th 1825.</u> The men still continue in a state of insubordination with respect to the measure of the corfs. (Buddle, JJ)

<u>August 15th 1825.</u> The pitmen still continue in the same state of insubordination and dissatisfaction with respect to the measurement of the corfs. (Buddle, JJ)

<u>Monday 31st October 1825.</u> The union men continue as obstinate as ever. In Rankin's shift in the Bensham they have stinted themselves to 15 corfs a day. (Buddle, JJ)

By the beginning of November the dispute had escalated from a deliberated reduction in production to an all-out strike. Once again Buddle used the law as by breaking their Bond the men were acting illegally.

<u>"Monday 7th November 1825.</u> The union men laid in the pit. Got the Bensham to work with deputies and about a dozen hewers who are not in the union. (Buddle, JJ)

<u>Tuesday 8th November 1825.</u> Got warrants against the following six men as ringleaders... (Buddle, JJ)

<u>Wednesday 9th November 1825.</u> Attended the court at South Shields, when the Magistrate Mr Fox, after a long hearing committed the (six) men to the house of correction at Durham, for 6 weeks to hard labour. (Buddle, JJ) <u>Thursday 10th November 1825.</u> Four of the hewers who are not union men at work being intimidated by the union men. (Buddle,JJ)

The Jarrow hewers were well organised, had support from other trades on the river and the strike took on a regional significance as the coal owners agreed to support Buddle against the union.

<u>Friday 11th November 1825.</u> The union men still continue very obstinate relying on assistance from their general fund, and from the other united trades. (Buddle, JJ)

<u>Saturday 12th November 1825.</u> Laid the case of the Jarrow Colliery before the Commission of the Coal Trade who were of the opinion that Messrs Brown ought to be supported against this illegal combination of their workmen by the whole body of the coal owners. It was therefore agreed resolved that if the men don't return to their work on Monday that a general meeting of the whole trade be convened at an early day to take the subject into consideration. (Buddle, JJ)

Buddle pressed on with his strategy of using the law against the strikers who had financial support, and showed no sign of giving way.

> <u>Monday 14th November 1825.</u> The united men still continuing refractory decided to convene a general meeting of the trade next Saturday agreeable to the resolution of the Committee. Decided also to get warrants against the under mentioned (6)

men and to take them before the Gateshead Magistrates next Saturday...

The union men seem to place great reliance on the assistance they are to receive from the general fund from the different united trades. They expect to receive 15 shillings per man per week, they are said to have received £10 from the united ship carpenters last Saturday. (Buddle, JJ)

As the dispute worsened the Magistrates for their part were still trying to find a compromise and were reluctant to send the pitmen to prison even though their action and their union were illegal.

> Saturday 9th November 1825. A general meeting of the coal owners was held at Newcastle when it was unanimously resolved that the trade at large should support Messrs Brown against the existing illegal combination of their workmen, and a special committee was appointed for managing the business. The six men (mentioned previously) were taken before the Gateshead Magistrates on complaint of absenting themselves from their work where they were committed to the house of correction but on their promising to give a decisive answer next Wednesday as to whether they will return to work or not, and lessen the dispute about the measure of the corfs to refer according to the 10th clause of the bond their commitment was referred until Wednesday next. (Buddle, JJ)

As the dispute dragged on at great cost to the owners Buddle tried again to use the traditional method of arbitration to find a settlement backed up if necessary by the full force of the law. Despite the Magistrates efforts neither Buddle nor the men were about to back down

> <u>Monday 23rd November 1825.</u> At the colliery. The union men did not get their pay at Newcastle last Saturday. They have to receive it from the local committee this morning at the colliery but I cannot learn by what rule, or at what rate they are to be paid. They are very sulky and won't let anything out as to their plan of operation. Gave direction to take out the earnings of the six men who are in prison from the binding up to the time when the dispute about the measure first took place to show whether their wages were, or were not as good as their neighbours. Gave directions also for a statement of the loss to the colliery by the abstaining of the union men to be made out, to ground a claim of indemnity from the trade. (Buddle, JJ)

> <u>Wednesday 23rd November 1825.</u> Took the under mentioned (6) pitmen before the Magistrates at Gateshead to have their determination as to leave the dispute about the measure to reference...

> They agreed to leave the matter to reference, provided Mr Thomas King was accepted as their referee, but he being objected to as incompetent by the magistrates, they refused to

appoint any other person, and refusing also to return to work were all committed to the house of correction, with the exception of Andrew Young for two months, Andrew Young was not committed in consequence of declaring his readiness to leave all matters in the dispute to be settled by two viewers. Sheerlock was committed for three months. Messrs Collinson and Liddell were the magistrates present. A considerable number of the men attended, they appeared considerably disappointed at the decisive conduct of the Magistrates, but still continued as obstinate as ever. (Buddle, JJ)

<u>Saturday 26th November 1825.</u> The special committee of the coal trade resolved that the agents should persist in the same line of conduct, offering the men a settlement by reference, and in case of their still refusing to get warrants against more of them. (Buddle, JJ)

By the end of November the strikers had been evicted from their cottages but the colliery was still at a standstill. Buddle was becoming desperate and tried a personal appeal to the men.

> <u>Monday 28th November 1825.</u> At the colliery. Most of the men have left the place and are dispersed among their friends at the several collieries on the two rivers. Saw two of the most reasonable of them, and told them if only a dozen or 20 of the well-disposed men would leave the matter to reference, and go

to work that they would not be molested, but should on the contrary be protected against the violent conduct of the union men. We wished to know how many and which of them would consent to this proposition as soon as possible as we mean to take out warrants against ten of a dozen more. (Buddle, JJ) <u>Saturday 3rd December 1825.</u> After trifling off all the week the men named Mr James Jopling of Hartley as their referee to meet Mr Hill on the part of Messrs Brown to settle all matters in the dispute, but on meeting in Newcastle they refused to abide by the decision of their referee and the business fell to the ground again. (Buddle, JJ)

<u>Wednesday 7th December 1825.</u> The under mentioned men (15) were carried before the Magistrates at Gateshead and committed to hard labour for two months in the house of correction...

Greener Robson for an assault was bailed. Warrants were got out against the under mentioned persons (5) for committing assaults... (Buddle, JJ)

With most of the union men in prison Buddle now attempted to break the strike by using men from other colliery trades who were of course idle to replace the striking hewers, but he met with unexpected resistance from the strikers wives who prevented the strike breakers from going to work. Feelings were running high and when a strike breaker was killed by a fall of stone it was greeted with some celebration by the supporters of the strike much to Buddle's disgust.

> <u>December 8th 1825.</u> Five of the union men acceded and started work this morning and several more would have followed their example but they were mobbed and prevented by the women from doing so. (Buddle, JJ)

> <u>Friday 9th December 1825.</u> Henry Mustard, a rollyway man, but who was hewing in the Bensham Seam, was killed by his top coal falling upon him. Some of the union connexion showed a degree of brutal exultation on the occasion. (Buddle, JJ)

> <u>Saturday 10th December 1825</u>. Got warrants against two of the women for assaulting and hindering the men from going to work on the 8th. (Buddle, JJ)

As the strike entered its sixth week faced with a united front from the owners and the prospect of other pitmen taking their jobs the hewers began to look for a way out of the deadlock. Buddle continued with his hard line threatening to take out warrants against twelve more strikers and on the twenty second of December after more than six weeks out the Jarrow hewers returned to work unconditionally and the strike was lost. In the aftermath of the strike the magistrate Nicholas Fairles acted on behalf of the men mediating the release of the strikers from prison and it was clear that the traditional system while stretched was not broken. The strike was a warning to the owners that the men were very much a force to be reckoned with and for the next few years at Jarrow the traditional system was strengthened not weakened by what happened. Buddle was much more willing to compromise with the men's demands; he knew without the support of the committee he would certainly have lost the strike.

> Saturday 17th December 1825. The union men sent in a proposition to go to work on condition of their comrades being let out of prison, of having four pence per score addition on the east way hewing price, and leaving the discussion of the Bensham price to a future opportunity, or to leave all points in the dispute to Mr N Fairles (a Magistrate). This proposition being laid before the committee of the coal trade they agree to give the following reply. That as the men had refused to submit the matter in dispute to two viewers according to the bond the owners of the colliery could not entertain any other proposition. (Buddle, JJ)

> <u>Monday 19th December 1825.</u> At the Colliery. Saw two of the union men who formed part of the deputation to the committee of the coal trade on Saturday. After much discussion I drew from them that if the men were liberated from prison they would return to work. I informed them that the decision of Messrs Brown, as well as the committee of the coal trade, was that they should return to work unconditionally. They replied that their instruction from the union general committee was that they

should not return to work unless they had a promise that the men should be released. We agreed to take out warrants against twelve more me, and to act upon them as circumstances may require. (Buddle, JJ)

<u>Tuesday 20th December 1825.</u> The men sent a written notice to the office this evening as follows: "These lines are to certify that we are ready to return to our work and employment according to the legal terms of our bond on Thursday 22nd. (Buddle, JJ)

<u>Thursday 22nd December 1825.</u> The men did return to work this morning according to the above notice. (Buddle, JJ)

<u>Saturday 24th December 1825.</u> A deputation of the men went to Newcastle this morning to petition the committee to liberate all the men that were in prison, on condition of their returning peaceably to work. This was agree with the exception of one who was committed for assault, and one for his second offence in refusing to return to his work. (Buddle, JJ)

<u>Monday 26th December 1825.</u> At the Colliery found the men all settling quietly to work their angry feelings much subsided. (Buddle, JJ)

The dispute had lasted five months and showed that the men could challenge the owners if the time was right. For Buddle the men were obstinate and when they refused to back down he tried everything he knew to get them to return to work: offering to refer the matter to arbitration (the magistrates and the viewers), trying to continue to work with other trades replacing the hewers, personal appeals, and finally the full force of the law. On their part the hewers were united and organised, they started the dispute with a go slow limiting the work of the colliery and hurting the owners without losing too much pay, later they went on strike supported by strike pay, and they and their supporters (their wives) effectively picketed the pit and stopped other trades from doing their jobs. In the end it was the coal trade committee subsidising the owner's losses and the full force of law which won the day, but it was a close run thing. With most of the union men in prison, more warrants due to be served on those remaining, and no sign of the owner's resolve crumbling the Jarrow hewers went back to work on Buddle's terms. It wasn't a bitter defeat; more of a strategic withdrawal, the real battle would come later, and Buddle was conciliatory in victory and did everything he could to get the pit back to normal working. A few of the ringleaders weren't reemployed, but most of the men went back to work without victimisation. Three of the men released from prison John Clark, John Gibson, and William Arnott died in the explosion of the 17th January just three weeks after returning to work. Some would have said it was a blessing to be dismissed from Jarrow then.

Unfortunately the Jarrow journals stop before the great strike of 1832 in which Jarrow played an important and notorious part so it is not possible to follow the final defeat of the pitmen's union in detail, but the broad outline of events is well known. The dispute began in 1831 when there was a general hewers strike at the binding for an increase in prices. The strike was coordinated by Tommy Hepburn's union (Hepburn was a powerful figure, a pitman and Methodist lay preacher who once worked at Jarrow) and despite the lesson of the 1825 strike it caught the coal owners off guard. Faced with this united action the coal trade committee's solidarity disintegrated and every colliery was left to negotiate its own terms. The strike at Jarrow was settled early and the hewers returned to work on the 21st May with an agreement that they would be paid 5 shillings and 6 pence for unseparated coal. This was a victory for the men who had used the strike to seize the initiative on safety at Jarrow as it allowed them to work with Davy lamps without the risk of using candles to sort the coal.

At the 1832 binding the coal owners led by Buddle stood together to break the union. Perhaps he expected the men to back down, but under Hepburn's leadership they stood firm and the bitter strike that followed turned to violence and led to Jobling's gibbeting and Buddle's breakdown. The exact details of what happened to Buddle are not clear, but it is said that his effigy was hung outside his house by pitmen at Wallsend, men he knew and trusted, and while his reaction to the murder at Jarrow is not documented in his papers it must have seemed to him that the certainties of his life were disintegrating and it was a devastating personal blow from which he might never have recovered.

The diaries say nothing about how he pulled his life back together after this his biggest breakdown, but in a reminiscence he described how he took up music again in the early 1830's after twenty five years absence and found to his dismay that his rough collier's fingers could no longer play his instrument of choice, the violin, but fortunately could still play the cello. Buddle in his later diaries is a different person, his working life is still dominated by coal, but now his social circle revolved around the concerts he hosted regularly at Wallsend House with his sister Ann, and music was now the centre of his life. His recovery was probably due more to Ann than anything else and she was the focus of his new life and increasingly his soul mate and partner as he grew older.

The Secret Diary

In 1834 John Buddle decided to start a personal journal, he called it his place book. All his life he had kept meticulous records and at first his new journal was little more than a business diary, but it soon grew into a complete record of everything he did. His close friend Thomas Sopwith, general manager of the London Lead Company lead mines in Allendale kept a diary for fifty seven years and perhaps Buddle got the idea from him. Sopwith was very much like Buddle, a practical miner, but also a geologist, a scientist, and a public figure, and he recorded everything of interest in his diary: people he met, places he visited, lectures and concerts he attended. By 1835 Buddle was doing the same and he kept his diary until a few days before his death in October 1843.

The diaries fifteen volumes (one is missing) record Buddle's recovery from his breakdown and the horrors of Jarrow. There are still deaths and disasters, especially the terrible Wallsend disaster of 1835, but increasingly they are filled with music and his enthusiasm for science and technology. His relationship with Lord Londonderry is one of the major themes, showing clearly that he was much more than Londonderry's Colliery Agent, he acted as his Lordships personal assistant and confidant and became deeply involved in Londonderry's political activities in the coal trade and beyond, fixing elections and giving evidence to Parliamentary Committees on behalf of his Lordship. Another major theme is the building of Seaham Harbour; construction was well under way in 1834, but the diary records his struggle to establish the new port against a background of Lord Londonderry's financial problems and hostility from the established ports on the Tyne, Wear, and Tees. Alongside the development of Seaham Harbour the diary documents Buddle's growing interest in shipping, he owned three ships himself, made a number of visits to Bristol to see Brunel's steamships the "Great Western" and "Great Britain" being built, and later often visited John Coutt's iron shipbuilding yard at Walker. He met with Coutts at Wallsend to discuss shipping and collaborated with him on the development of an iron steam collier which he hoped would complement the modern port facilities at Seaham Harbour and revolutionise the coal trade. Unfortunately Buddle died before the plan was complete and Coutts without Buddle's support went bankrupt, but the ship iron steamship with a screw propeller and water ballast called QED was built and it deserves recognition as the forerunner of the modern steam collier.

The diary tells the moving story of the great events of Buddle's later life, the Wallsend Colliery disaster which killed 101 pitmen, the fire which destroyed Lord Londonderry's mansion Wynyard Hall and the death of his beloved sister Ann. It also tells the story of the ordinary and insignificant routines of his life, the shows and concerts he attended, the musical evenings he held at Wallsend House, his interest in science and his love of music. It reveals his public life as a member of the Forest Commission regulating free mining in the Forest of Dean and his private life as the uncle who gave magic lantern shows to his nieces and nephews, and had a massive bloodhound called "Duchess".

Buddle travelled widely and the diaries document the development of railways in Britain and the details of the growing rail network from a passenger's point of view. Travelling regularly on business to London or Bristol Buddle used a variety of routes and at first he preferred mail coaches to trains as he enjoyed the intimacy of the coach with a few select companions against the more crowded trains. Significant railway events recorded in the diary include the opening of the Newcastle and Carlisle Railway and the building of Victoria Bridge which was the final link in the first main line from Tyneside to London. Buddle's quarries provided the stone for the Bridge and he surveyed the line with Thomas Sopwith and recorded its progress in his diary in great detail, a unique record of one of the greatest civil engineering projects of its day.

Buddle kept his diary for himself so he could remember places he visited and performances he attended, there are many theatre programmes stuck in the diaries like a scrapbook, but it is clear they were also intended to be read. Each volume had an index and there are references that can be followed up. Certainly he had a sense of its historical importance, and he clearly wanted his records to be preserved, but it seems likely that the descriptions of people and places must have been intended for his family and friends. A few of the entries are in code, but the details of Lord Londonderry's debts, bank borrowing, and dishonoured bills are in plain text, Buddle didn't seem to regard them as sensitive, the coded entries are personal about Lord Londonderry and his family and the illness of his sister Ann. Ann is one of the people who would have read the diaries and the coded entries are things he didn't want her to know or want the children to see when he was reading them descriptions of his travels. From such a mass of material it is only possible to select a small fraction of what is available, but the sections which follow illustrate the major themes and important events in John Buddle's later life, and also show something of his ability as a writer able to describe both dramatic and everyday events in an interesting and informative manner.

An Arranged Marriage

In 1819 the proposed marriage of Charles Stewart, a 41 year old diplomat and professional soldier to Frances Anne Vane-Tempest, a wealthy Durham coal heiress was the talk of London society. Baron Stewart as he was then was the Ambassador to Austria and had a distinguished career with Wellington in the army during the Napoleonic Wars behind him. He was also a notorious womaniser whose scandalous behaviour during the Congress of Vienna appearing openly drunk in the street, consorting with prostitutes, brawling and molesting women made him something of an embarrassment to the British. More importantly from the point of view of Frances Anne's father Stewart was a man with prospects, the heir to the title Lord Londonderry, and he was available, his first wife Catherine had died in 1812. Stewart had one son from his first marriage,

Henry Vane-Tempest was a shrewd man and as part of the marriage settlement Charles Stewart changed his family name to Vane so that the Vane name would live on in the peerage. Stewart wasn't exactly impoverished, but he was short of the money needed to live the sort of lavish lifestyle he thought he deserved so from his point of view Frances was a great catch and he was prepared to do anything to secure the marriage. Perhaps he underestimated the Vane's as Henry Vane-Tempest did not lightly place his family fortune at the mercy of the profligate aristocrat so Frances's money was tied up in a family trust for the benefit of her children and Charles got only a life interest in the income of the Vane Durham Collieries, still a very substantial sum, but an arrangement which left him perpetually short of money and made John Buddle and important figure in his life. Lady Frances Anne, a strong willed woman with her father's determination to protect her family, never consented to any variation of the trust despite her husband's constant complaints and with Buddle kept Stewart who became Lord Londonderry in 1822 on the suicide of his halfbrother Lord Castlereagh the foreign secretary, frustrated for the rest of his life.

Buddle's appointment as Lord Londonderry's Colliery Manager in 1821 changed his life. Buddle had been Lord Durham's colliery agent since 1807, a post he inherited from his father, and he came to Lord Londonderry, a stranger to Durham and coal mining, with the best of references. Buddle controlled the Londonderry Collieries, his Lordship's main source of income, and became an intermediary between Londonderry and Mr McDonnell, his trustee, and Mr Gregson, the trust's solicitor. Lord Londonderry was not an easy man to deal with and his relationship with McDonnell in particularly was stormy. In time he grew close to Buddle and became increasingly dependent on him to manage not just his collieries, but also his complex financial affairs and his relations with the trust. In truth Buddle was a double agent, he greatly admired Lady Frances Anne and acted with McDonnell to make sure the terms of the trust were enforced to protect her interests. Something of the character of Londonderry and his frustrations with the restrictions of the trust can be seen in this entry from Buddle's diary dated the third of February 1838:

Saturday 3rd February 1838. Accompanied Mr McDonnell to Ravensworth Castle to see Lord and Lady Londonderry, on the subject of the North Pittington renewal – the fine paid to the Dean and Chapter (the Church of England) for which is £15,000. Mr McDonnell has paid this fine...Lord Londonderry expressed the strongest possible object to Mr McDonnell's holding the assignment of the household property at Wynyard (as security) and it was impossible to reconcile him to the expediency and propriety of the measure. His feelings on this subject are morbid, as he seems to view his own personal interest in the affairs, as tenant for life, as separate from and in opposition to the interest of his Family, instead of considering them as being mutual and beneficial. (Buddle, PB)

Buddle makes the pointed comment in his diary that Lady Londonderry was present "for the greater part of this discussion".

It was a problem which was to recur regularly in Buddle's relationship with Lord Londonderry. Colliery bills had to be met, the money was not available, and Lord Londonderry sought to realise capital from the Trust to meet them, and overspent heavily on his personal account In 1835 Lord Londonderry's net income from the Londonderry Collieries was more than £45,000 per annum, a massive sum, yet he had personal debts of £30,739 in London, £28,771 in Durham, and £5,717 at Wynyard. The collieries hard pressed by his Lordship's drawings owed £91,445 to colliery tradesmen and Londonderry was £59,044 overdrawn at the Joint Stock Bank in Newcastle. In February 1835 Buddle paid the colliery wages, more than £2,000, out of his own pocket. Londonderry's solution was to raise new loans to cover his debts and attempt to sell trust assets which brought him into continuous conflict with his professional advisors Buddle, Gregson, and McDonnell. Buddle was to some extent sheltered by his close personal relationship with Lord Londonderry, and his role as Londonderry's intermediary with Gregson and McDonnell who Londonderry came to detest, but the potential for conflict was always present and in 1841 it all came to a dramatic head with the great fire at Wynyard Hall Lord Londonderry's Durham home.

> <u>Saturday 20th February 1841.</u> Received a note from Mrs Hunter to say that Hunter had been called away to Wynyard at 5 o'clock this morning in consequence of the house being on fire; immediately sent for my cab to Wallsend and proceeded to Pensher, where I expected to gain further intelligence but no communication had been received there. I took a fresh horse and proceeded to Durham – met Robert Elliott on the way who told me that it was currently reported that Wynyard house was entirely burnt down. Met Mr Hunter at Durham who had just come from Wynyard, and (he) told me that the East wing of the house was the only part saved – the rest being entirely

consumed. Proceeded to Wynyard with Hunter, and found the body of the house a mass of smoking rubbish between the main walls, which was all that remained of this part of the magnificent mansion. The night was spent in playing the extinguishing engines upon the hot rubbish and burning timbers etc... (Buddle,PB)

Sunday 21st February 1841. When day light came this morning I surveyed the state of the building and found the devastation complete so far as the fire had extended. It had been cut off at what may be called the South Eastern Wing of the Building, and Lady Londonderry's Boudoir and lodging room, Lord Londonderry's room, part of the small living room, the Bird Room - together with the lodging rooms above, and the nursery, kitchen, servant's hall and all the offices etc. But the main body of the house is entirely destroyed, with the exception of the walls - the stone work of which is not much injured excepting the joints and lintels of the windows some of which are broken at the angles. From the Conservatory to the small dining room and boudoir is one immense void – open to the sky at the top, and an immense mess of smoking rubbish in the bottom – the debris of the roof, flooring of the upper apartments – the plastering and bricks from the interior casing of the walls etc. The only thing left between the main outside walls is the iron truss beam which

supported the upper floor. The cause of the fire is not known yet and probably never will – but there is no doubt whatever, that it commenced about the Chapel, or Conservatory, and most likely from the flues for warming either the one or the other of the. I collected the following information from the parties present.

About a quarter before twelve o'clock on Saturday night two of the game watchers being in the garden field – about half a mile from the house – observed a great quantity of smoke at the house, which alarmed them and they ran immediately to see the cause of it. On approaching the house, they perceived flame issuing from the lowest window of the stone stair case. between the Chapel and the Conservatory. One of them immediately went to alarm the servants in the house, and the other ran to Salter House to call Hikely. Hikely went to the house with all speed and when he arrived the fire was issuing from three windows and the Conservatory and Chapel were on fire and the roof beginning to ignite. He sent off the Huntsman to Stockton immediately for the engines and took every means to alarm the neighbourhood, and got out the small extinguishing engine belonging to the place, but the pipes were frozen and it would not work with effect – besides there were not a sufficient number of people on the place to work it. He then set out all the
force he could collect to remove the furniture, pictures books etc. out of the house. Shortly after one o'clock the engines from Stockton arrived but by this time the great gallery was on fire, and utterly beyond the control of the engines. They were therefore applied to throw water into the small dining room, and the rooms above it, and the boudoir, and the floors were cut in the upper apartments of the main body of the house to prevent the fire from extending into the South East wing, as it was now evident that the main body of the house would inevitably be destroyed. Meantime the people from Thorpe, Wolvistone and the neighbouring farm houses came flocking to the place and lent every assistance in getting the furniture, pictures, etc. out. As the fire advanced from the South West or Conservatory end of the building the roof fell in, and by 5 o'clock the whole of the roof and flooring of the upper apartments had fallen in – and the sole object became the preservation of the East wing which was fortunately effected. Nothing can be more complete than the destruction made as far as the fire extended. In the Conservatory the tubs in which the orange trees (which) formerly belonged to Bonaparte and brought at great cost from Malmaison were burnt – the iron hoops only remaining in a heap round the place where the trees stood. The baked soil which filled them was standing in heaps with the charred stumps of the

trees sticking in them. The day was spent in cooling the rubbish and extinguishing the burning fragments of the bond timbers and fragments of the joists etc. A guard of five policemen from Stockton kept guard. Major Wemyes the inspector of police visited the place and offered to send any number of his men that might be though necessary. Immense numbers of people came from all parts to see the scene of desolation but they were kept at a distance from the building. (Buddle, PB)

Buddle knew the house well and his description of the fire almost reads like a police report or one of his investigations into a colliery disaster. As always he wanted to find out the cause:

> <u>Wednesday 24th February 1841.</u> Accompanied Mr McDonnell to Wynyard this morning – on our arrival we found Lord Seaham there, he had arrived at 7 o'clock from Oxford. We examined the ruins, and the furniture etc. which had been saved from the flames and which far exceeded in quantity what we expected. We agreed that it would be proper to have it arranged or classified and a schedule of it made. Mr Sopwith happened to arrive at this time with Mr Robert Hawthorn (engineer). Mr Sopwith at my suggestion approved by Mr McDonnell undertook to send his foreman upholsterer to arrange to schedule the furniture. Examined the flues of the Conservatory and Chapel stoves – but could not discover anything to induce me to

believe that the fire had been caused by them. I am strongly inclined to think that it originated in the Chapel and think that Golightly the joiner, who says he examined it at 10 o'clock on Friday night, should again be examined. It was decided that Lord Seaham should start tomorrow for Naples direct to report to his father the state of these unfortunate affairs. I returned to Durham with Messrs Sopwith and Hawthorn. It does not appear that any insurance has been made on Wynyard House or furniture since December 1832 so that it will be a total loss. (Buddle, PB)

Wednesday 12th May 1841. I proceeded to Wynyard and found Lord and Lady Londonderry there with Lord Adolphus. I found both Lord and Lady Londonderry in better spirits and bearing up against the terrible to them shock of the great destruction made by the late fire, than I expected. But Lord Londonderry expressed his determination to reconstruct the burnt down part of the mansion and had Benomie the architect with him consulting on the plan of proceeding for that purpose. Benomie estimates the cost of roofing and putting new windows into the burnt wing at £5,800, and the reconstructing of it from £40,000 to £50,000. Lord Londonderry pushed me to lend him assistance in the rebuilding which I told him I could not do without Mr McDonnell's (his trustee's) consent, and I endeavoured to dissuade him from the notion of rebuilding at present but he did not relish this at all and it led to a discussion in which his Lordship repeated his detestation of the Trust and his determination to get quit of it if possible when Lord Seaham comes of age. I suggested to him the expediency of shutting up Wynyard for four or five years, and letting off the garden and park by which he might save about £4,000 a year. But he repudiated the idea unless in the event of a change of Government he might be appointed to a foreign embassy. I slept at Wynyard. (Buddle, PB) <u>Saturday 15th May 1841.</u> Went over the Harbour with Lord Londonderry and had a long and unsatisfactory discussion with him on the state of his affairs as usual. He is determined to get quit of the Trust, if possible and also to rebuild Wynyard neither of which I think he can accomplish. (Buddle, PB)

<u>Monday 17th May 1841.</u> (At London) Called upon Mr McDonnell and had a long conversation with him on the subject of Lord Londonderry's affairs. I told him and he admitted the necessity of furnishing me with written instructions for my government as manager of the Collieries to protect me from collision with Lord Londonderry on the subject of getting assistance from the Collieries to carry on the work at Wynyard. Mr Gregson to be consulted on this subject; Called upon Mr J Gregson and had a long discussion with him on this subject. (Buddle, PB) Friday 21st May 1841. Met Mr McDonnell at Mr Greason's where a letter was drawn up for my instructions for the management of Lord Londonderry's collieries under the Trust to protect me from being annoyed by demands from Lord Londonderry for assistance from the collieries to rebuild Wynyard. (Buddle, PB) Sunday 23rd May 1841. Mr Gregson came to me at 11 o'clock and we went together to Mr McDonnell who had not seen Lord Londonderry since he returned to London and he declines seeing, or communicating with him until his Lordship signs the trust accounts for last year. Mr Gregson and I waited on Lord Londonderry at Holdernesse House - his Lordship seemed disappointed and annoyed that Mr McDonnell was not with us. His Lordship went into a long string of complaints and arievances to which he attributed his being kept so long in Trust, and laid great stress on the general mismanagement of his affairs which tended to keep him longer in trust. All this was intended to impugn Mr McDonnell but more particularly my own (management). He alleged that he had ascertained when down last week, that a great deal of unnecessary expense was going on at the harbour in embellishment and building walls etc. That he could prove this and much more and that he was determined to have an inquiry instituted into those matters before he would sign the accounts; Mr Gregson explained to

him that £60,000 remained yet to be paid to satisfy the objects of the Trust. This his Lordship said he conceived might be accomplished when Lord Seaham came of age but Mr Gregson observed that it would be impossible to accomplish this and rebuild Wynyard also. Lord Londonderry then went into a long (rant) about the colliery agents not assisting him with anything from the collieries and accused them of not caring anything for him, so long as they got their own high salaries paid, and that some of their number in particular was getting rich which it was impossible he could do honestly and from his impertinence in not sending horses lime etc. to Wynyard he insisted on his being dismissed immediately-and also the men. I told his Lordship that this attack on my management rendered it necessary that an investigation of the past up to the present should take place, but that it was for me to consider whether I would in future submit to continue in a situation of such annoyance as I owed it to my own character not to do so. In reference to my large salary I said it had not been paid in full neither principle nor interest – he got (angry) upon this and said the observation was impertinent. Warm words ensued and he said that for his part he would consent to release me from the management under the Trust – to which I replied that if others would do the same I should be but too glad – and we parted on very bad terms. Mr Gregson

and I returned to Mr McDonnell, where he expressed his determination to conduct the affairs of the Trust strictly without permitting Lord Londonderry's interference, and instructed me to act upon the orders contained in his letter to me of yesterday. I made up my mind not to hold any further correspondence with Lord Londonderry. Mr Gregson witnessed all that occurred on this occasion. (Buddle, PB)

1841 was undoubtedly the worst year of Buddle's life. His sister Ann was his lifelong partner, she lived with him at Wallsend House, she was the hostess of his musical evenings, and they went to theatres and concerts together. Shortly after his quarrel with Lord Londonderry she became seriously ill. Ann had been diagnosed with a terminal illness probably cancer in March 1840 (Buddle wrote the entry in his diary about the Doctor's visit in code so she couldn't read it). He first mentions her illness openly on the 12th June 1841 and by then she was in the final stages of the disease. On the 14th June 1841 he wrote "sister getting gradually weaker and weaker" and she died the next day.

> <u>Tuesday 15th June 1841.</u> About two o'clock this morning my Dear Sister became much weaker, her feet and legs became limp and she lost the feeling and use of them. At five pulsation ceased and she expired at a quarter before nine. She was seized with vomiting of blood at two o'clock, after which she never again raised her head, but complained of being faint. She

took occasionally a little oatmeal tea and wine and water, out of a tea spoon – a few minutes before she died a sort of fluttering took place in the region of the heart and stomach, after which she remained perfectly tranguil and composed – her mind as firm and collected as possible, until she expired, which took place as if she had fallen into a tranquil sleep. Thus departed in peace, after long and intense suffering which she bore with exemplary patience and fortitude, one of the most amiable kind hearted, and benevolent creatures that ever adorned human nature. The afternoon preceding her death she wrote with pencil on a scrap of paper unseen by anyone a memorandum bequeathing her trinkets etc. to her niece Mrs Hunter. This memorandum was written in a firm and legible hand as if she had been in perfect health. She also made several bequests – a few minutes before she expired she requested that her body might not be disturbed, and stretched out, too soon after her death. She had expressed a wish to be interred in my vault at Benwell that we may rest in the same grave, as we had lived in peace and concord all the days of our lives. This was a sorrowful day. (Buddle, PB)

On the night of Ann's death, almost as if in a symbolic pyre for the passing of a woman the pitmen held in great regard, Wallsend Colliery caught fire. The fire put the future of the colliery and the lives of the pitmen in great peril, but understandably because of Ann Buddle's death his response was muted and he left it for his men to deal with. Much to his relief a disaster was averted and even in his grief for Ann he was full of praise for his men:

> A wedging 10 or 12 fathoms below the cast iron tub in the A pit Wallsend Colliery gave way last night. The fall of the water down the shaft turned the air, and the current was so strong that it blew the flame of the furnace back, and set fire to the timber behind. This became a very alarming and dangerous affair, as the pipe drifts were foul. John Atkinson assisted by the overmen and wastemen and several of the pitmen set to work in the bravest and most energetic manner, and with the utmost and most persevering exertions, at length succeeded in getting the fire extinguished – fortunately without anyone being hurt – further than what they suffered from the effects of the smoke. Everyone did his duty manfully on this occasion, and all the pitmen evinced the most praiseworthy anxiety to render every assistance in their power and were ready to run all risks. (Buddle, PB)

> June 16, 17, 18, 19th1841 Spent at home – preparations for the funeral going on. On the afternoon of the 17th the body was put into the shell. On the evening of the 19th it was put into a lead coffin and soldered up – and then put into the coffin which was covered with black cloth and ornamented with brass nails and

handles, in the usual manner. A brass plate was placed on the coffin with the inscription "Ann Buddle died June 15th 1841 aged 55 years" engraved upon it. The corpse was deposited in the drawing room, and Charles Bragg was the undertaker. (Buddle,PB)

Sunday June 20th 1841. The funeral took place this morning...On the funeral arriving at Benwell Colliery the pitmen etc. formed themselves into a procession in the rear of the carriages, and accompanied the corpse to the church and attended the interment. Nothing could be more respectable than their appearance and their conduct was most becoming and respectful. The corpse was deposited in my vault being the first occupant of the solemn abode. God knows who will be next... William Nicholson came from Seaham Harbour, where the ships had been put into mourning and the shops half shut all the week after the intelligence of my sister's death reached the place. (Buddle, PB)

Buddle's busy work schedule continued unabated. If he was depressed by his sister's death and his quarrel with Lord Londonderry his diary doesn't show it although there was no music for a while. Two months after his sister's death he had reason to celebrate.

> <u>Sunday 8th</u> August 1841. At home Robert Atkinson's child christened at Wallsend Church by the name of Buddle Atkinson.

Mr Easterby and myself Godfathers, Mrs Burnett (his sister) and Miss Westmoreland Godmothers. (Buddle, PB)

At the end of his life Buddle was very close to the Atkinsons and Robert Atkinson was the main beneficiary of his will. He must have missed the society of Lord Londonderry and his trips to stay at Seaham and Wynyard more than ever after the death of Ann, but he wasn't a man to back down in a quarrel. Lord Londonderry was and on 12th November 1841 after six months silence the proud and quick tempered noble Lord apologised. It wasn't something that Londonderry would have found easy, and it reflected how much he depended on Buddle. Buddle discretely (and unusually) doesn't reveal the full contents of the letter in his diary but it was what he wanted. He noted the letter in his diary without a hint of the satisfaction it must have given him in this bleakest of times.

> <u>Friday 12th November 1841.</u> Received a conciliatory letter from Lord Londonderry at Mount Stewart which enabled me to resume my correspondence with his Lordship. (Buddle, PB)

It seemed the reconciliation mattered to them both and at the end of a disastrous year Buddle was back at Wynyard building bridges with Londonderry and enjoying his readmission into the family circle.

> <u>Wednesday 29th December 1841.</u> Went to Wynyard this forenoon to see Lord Londonderry not having seen him since our grand fracas in London last May; He received me very courteously, and appeared to have buried in oblivion all the disagreeable

matters which have passed between us. I had a very long discussion on all his affairs with his Lordship ... His Lordship was not in spirits, and he is broken and looking much older since I last saw him. His hearing is also much worse. In the evening we had music, Signor Sola the celebrated Italian Composer, Singer, and Musician was there having come for two or three weeks to teach the young ladies. Lord Seaham, Lady Frances (Lord Londonderry's daughter Later to become the Duchess of Marlborough), and the Signor sung some Italian threes very nicely. Lord Seaham though not a musician has a good bass voice and sings well by the ear. Lady Frances has most extraordinary execution on the Piano Forte; she played some difficult arrangements in excellent style. She has an extraordinary musical memory as she played some long complicated movements while merely glancing at the music. The Signor is a beautiful flute player. (Buddle, PB)

Buddle slept overnight at Wynyard and returned home the next day. His return to favour was marked by Lord Londonderry's request that he organise a fete at Pensher to celebrate Lord Seaham's coming of age. This was an event of more than family significance, Lord Seaham was the heir to the Londonderry title and his coming of age was something Lord Londonderry hoped would hasten the end of the hated trust. The Royal Duke of Cambridge was going to be present and Buddle planned to cater for 1630 people, mostly pitmen, at a cost of £150. Each was to be allowed one and a half pounds of beef, three loafs of bread, and three pints of ale, and there would be twelve policemen present to keep order.

> <u>Wednesday 24th August 1842.</u> I met the Duke of Cambridge with the party from Wynyard at the Grange at half past three o'clock, and escorted them with all Lord Londonderry's agents and several other persons, mounted to Rainton Meadows. The Duke of Rutland, Lady Londonderry, and Lord and Lady Exeter were in the carriage with his Royal Highness. On meeting the Royal Carriage I addressed his Royal Highness as follows:

> "May it please your Royal Highness I have the honour to present myself to your Royal Highnesses notice, as the manager and director of the most noble and gallant Marquis of Londonderry's Collieries. I am accompanied by his Lordships Agents who request me in their name, to express in their name, the high gratification they feel in greeting your Royal Highness on your arrival at the Noble Marquises' Collieries, on this memorable occasion. We feel the more gratification in welcoming your Royal Highness in as much as your Royal Highness is the first member of the illustrious House of Brunswick, who has conferred so distinguished an honour upon us."

> I showed his Royal highness the machinery, screens, etc. about the Meadow's Pit and the pumping engine about all of

which he was very curious and inquisitive. I sat next to his Royal Highness in the Wellington Carriage down to Pensher and the Duke of Rutland, Lady Londonderry, Lord and Lady Exeter, with several others were in the Carriage. His royal highness was very inquisitive on everything and every subject and was exceedingly affable and communicative. He is a fresh looking person of his age 68. He is quite bald having only a narrow fringe of hair round the nape of his neck. Lord Londonderry did not come with the party, but met them with several Lords and Ladies who had accompanied him from Durham, at Pensher. At lunch Lord Londonderry gave my health in the most complementary and flattering manner to which I replied in appropriate terms and gave as a sentiment:

"May the noble House of Wynyard never be without an heir – male down to the latest period of posterity"

When the company left, for the dinner and Ball at Sunderland Mr H Browne and Mr McDonnell remained with me at Pensher dined and stayed all night. All the immense crowd of people who had assembled on this occasion, dispersed in the evening in the most orderly manner. (Buddle, PB)

And so the Day was a great success for all concerned. Lord Londonderry put on a show of his loyal workers to his royal guest and John Buddle enjoyed the company of the highest in society. <u>Thursday 25th August 1842.</u> I attended the public breakfast this morning at Seaham – it took place in the Hall at one o'clock. Lord and Lady Exeter having to go away early, I accompanied them with Lord Londonderry to the Harbour between elven and twelve o'clock, and showed and explained to them the different works and operations at the spouts etc. in which they were much interested. After breakfast the Royal party visited the harbour – His Royal Highness inspected every part, and as usual was very inquisitive and much interested in seeing a large sloop enter the Harbour. After viewing the Church the party set off for Wynyard for dinner, and after addressing the assembled workmen on behalf of Lord Londonderry I returned to Pensher. (Buddle, PB)

Buddle didn't change his attitude to Lord Londonderry's spending, but after their quarrel Londonderry seemed to warm to him as a trusted adviser and old friend and used his influence to get Buddle appointed as a magistrate fulfilling one of Buddle's dearest ambitions. He got the news at a fancy dress ball at Wynyard attended by over 600 people in honour of the Duke of Cambridge.

> <u>Thursday 4th October 1842.</u> Lord Londonderry showed me the Secretary of State's letter appointing me a magistrate for the County of Durham...(Buddle, PB)

It was a just a small gesture from Londonderry, but it meant a great deal to Buddle. Londonderry never managed to get out of the Trust; that was something John Buddle was both unable and unwilling to deliver.

<u>Seaham Harbour</u>

In 1820 Sir Ralph Milbanke the owner of Seaham Hall commissioned William Chapman to draw up a plan for a new port at Seaham. The idea was simple; the new port would ship coal direct from the Durham coalfield avoiding the costly carting of the coal to the Wear at Pensher and the harbour dues at Sunderland. The cost of the scheme discouraged Sir Ralph from going ahead with the plan and the following year the Seaham estate was on the market. It was bought at auction for £63,000 by Charles Stewart Vane, the new husband of Frances Anne Vane, the heiress of collieries at Rainton and Pensher, with the aid of a mortgage from his half-brother Lord Castlereagh in what was from the start a commercial venture. Lord Vane, better known of course as Lord Londonderry from the title he inherited on Castlereagh's suicide in 1822, was advised by John Buddle, and had information which made Sir Ralph's expensive plan viable, and which he was sure would make him rich.

Buddle knew that the Durham coalfield extended eastwards under the magnesium limestone plateau of East Durham and that there were vast unexploited reserves of coal under the Seaham Estate which could be shipped from the new port at a fraction of the cost of shipping them from Sunderland. Reaching the coal through the limestone was a problem, it was saturated with water, but Buddle knew that it was possible, his father had developed a system of cast iron tubbing which could hold back the water at the end of the Eighteenth Century, and the high pressure steam engines then in use in the coalfield were more than capable of keeping the shafts dry. The new port would also be able to ship coal from the Vane collieries at Rainton and Pensher and save Lord Vane, a life tenant benefitting from the income of the collieries, thousands of pounds in transport and shipment costs, but that wasn't the main reason the port was built, it was to ship the coal from the new pits and show that Vane despite what people said wasn't dependent on his wife's wealth.

Building the new port was easier said than done, Lord Londonderry, a life tenant without access to his wife's great wealth, was already desperately short of money to fund his lavish personal lifestyle, there was no natural harbour at Seaham and everything would have to be built expensively from scratch. Without John Buddle who managed the project on behalf of his Lordship and made the creation of the harbour his life's work it is unlikely that the town would have taken shape the way it did. It is difficult to see how Londonderry short of money and living beyond his means already would have found a way to complete the harbour without Buddle and his personal commitment to the new town which he saw increasingly as his project.

Buddle's diaries do not record the early years at Seaham. By the time the place books starts 1834 the first stage of the Harbour was largely complete funded by an overdraft at the bank, increased drawings from the Collieries, and later a loan on from the Bank of England on Exchequer Bills. Buddle's diaries tells the story of the final completion of the south dock, his struggle to establish the new coal port in the face of determined opposition from the existing coal ports of Newcastle (Tyne), Sunderland (Wear), and Hartlepool (Tees) which included sabotage and the bribery of Captains not to load at Seaham.

> <u>Thursday February 12th 1835.</u> The works have been much impeded during the last six weeks by the stormy weather impeding the bringing of the stones found from Pensher (the stone for the Harbour came from Buddle's quarry at Pensher). Nevertheless the dock wall is joined to the south gate pier to within two courses of its full height, and the foundation of the wall to join the A gate pier with the spur has been put in, and is 2 or 3 courses high. The new stationary engine and incline to the lime kiln is completed, and in full operation. And the railway up Railway Street for the conveyance of the ballast to the Dene, for forming the new road access is in progress of being laid. (Buddle, PB)

> <u>Wednesday March 4th 1835</u>. Examined the works at Seaham Harbour. The foundation of the south dock wall is now laid all the way up to the shore, and the walling would have been considerably advanced, if the late bad weather had not prevented the blocks being brought round. The connecting wall between the North Pier of the dock gate and the spur is finished to within 2 courses of its full height; so that if all goes on well the water will be shut out of the dock about the end of the month,

and then the excavation will go on rapidly. Have got one half of the eastern dock gate put upon waggons ready to be carried down to its place. As the Haswell coals will be ready for shipping in May I gave directions for several matters to be done in preparation to receive them. (Buddle, PB)

<u>19th March 1835.</u> Met the Haswell Company - present Messrs Clark, Lamb, H Taylor, Thomas Taylor, William Bell, and Thomas Forster their viewer and Mr Hawthorn their engineer – at Seaham Harbour. We examined the approaches to the Harbour on the land side, and agreed upon the outlines of the plan to be adopted for shipping their coals. It is proposed to give them two spouts and shipping berths at the SW side of the dock. Thorman and Nicholson are to make a plan of the connecting branch from Braddyls Way with an estimate of the expense of making it, with the platforms for the waggons. Have got 300 tons of pier blocks round from Pensher this week which will enable Thomas Nicholson to close the W end of the dock wall so as to shut the neap tides out on the 23rd inst. (Buddle, PB)

<u>Wednesday 27th May 1835.</u> At Seaham Harbour planned the sidings, turn rails, etc. with Thorman and Nicholson for shipping the Haswell Coals, but it will not be possible for us to have all things ready for shipping coals in the dock against the 21st June. We must therefore accommodate them with our east spouts for

a short time until the spout at the number three berth in the dock can be got ready. As the Haswell Coal Company fancy a drop in preference to a spout, decided to put up a drop for them at the 4th or east berth in the dock. Every exertion will be made to get matters ready for letting the water into the dock next springs but I question it can be done. After hearing the arguments of Mr Spence, and Moly and Tom Elmore as to whether the moorings in the dock should be mushroom anchor, chain and anchor or by dolphin, decided in favour of the dolphin. Messrs Forster, Davidson, and Potter at the harbour. Mr Forster's object was to inquire, as to the increased forms of shipping which the opening of the dock might afford them, as they calculated in future on having 3,500 chaldrons a month to ship. I explained to him the very great advantage which would arise from our being able to load, and move ships, to and from the spouts at all times of the tide as soon as the dock is finished and as the dock would hold from 50 to 60 sail of vessels independent of the light vessels basin, I scarcely apprehend any interruption to the regular loading of any of our coals will ever be experienced. He was very much satisfied with this prospect, and said they would certainly give a decided preference to the harbour provided it would afford them accommodation for the regular shipment of their coals. (Buddle, PB)

<u>Wednesday 10th June 1835.</u> At Seaham Harbour with a party consisting of Mr Easterby, Miss Lock, Mr Mrs and Miss Morton, Mr Burnett and Miss Buddle: the laying of the branch of the railway to bring the Haswell Coals to the spouts is in progress, and the excavation of the dock will be finished in a week and the dolphin and large mooring buoy will be finished at the same time. The fencing on the inside of the dock is also in progress, and the gates are all hung so that water may be let into the dock in a fortnight. (Buddle, PB)

<u>Thursday June 11th 1835.</u> During the high spring tide this afternoon the water found its way through the foundation of the wall between the outer gate pier, and the spur pier, and filled the dock. The water rushed in with great violence, before the sluices in the gates could be opened (Buddle, PB)

<u>Friday June 12th 1835.</u> Examined the dock wall this morning – the aperture by which the water found a passage under the foundations of the wall has been formed by the pressure of the water at high tide forcing its way through one of the fissures in the limestone rock which was filled by soft mud. This fissure had been laid open by deepening the channel to the dock gates. The side walls remain firm, but the filling is washed out from between them for about 20 feet in length... This aperture may be effectively stopped and no permanent injury will result from it –

the only injury arising from it will be the retarding of the excavation of the dock for a week or ten days. (Buddle, PB) <u>Wednesday 29th July 1835.</u> At Seaham Harbour in the afternoon. The leak in the north pier of the gate having been completely stopped yesterday opened the gates and let the water into the dock this afternoon. The gates not to be shut to keep the water in till tomorrow when for a few tides only 8 or 9 feet of water to be let in till the cement has hardened. (Buddle, PB)

<u>Wednesday 12th August 1835.</u> At Seaham Harbour – opened the sluices in the dock gates at low water, when there was 6 feet of water in the dock. This produced a very powerful scour in the channel from the dock gates to the mouth of the harbour. This experiment showed very clearly that the scouring power of the water from the dock will effectually clear the channel at any time if it should be impeded by sand. (Buddle, PB)

<u>Thursday 20th November 1835</u>. At Seaham Harbour – 50 ships in and very busy shipping coals... (Buddle, PB)

The new port had arrived. The first coal to be shipped from Seaham Harbour was carried in a ship owned by John Buddle. By the end of his life he owned three ships and took a deep interest in everything connected with ships and shipping. His diary records the purchase of his second ship.

<u>Monday 13th March 1837.</u> Spence called on me, and recommended me to buy a new ship, which will be finished at

Sunderland in six weeks, of about 16 keels burden. The cost of the hull will be from £1,730 to £1,750, and the outfit £700 more making £2,450 in all – cash payment. This he considers a cheap purchase, and as the prospect for the shipping is very good at present I decided to purchase this vessel. (Buddle, PB)

<u>Thursday 25th May 1837.</u> Went to Sunderland to see the new ship John Buddle which was launched at Sunderland Saturday and is now fitting out – its tonnage according to the new measurement is (225 tons). (Buddle, PB)

(Later in the year he ordered a second ship)

<u>Wednesday 8th November 1837.</u> Paid Spence £400 being the first instalment for the building of the new ship to be called the "Mary and Ann" (named after his sisters) (Buddle, PB)

<u>Monday 18th December 1837.</u> At Sunderland to inspect my new ship the "Mary and Ann" now building by Leathead. She is timbered and a considerable quantity of the planking put on. As far as I can judge the timber and workmanship are both very good. Mr Leathead expects she will be ready to launch by the back end of next month. (Buddle, PB)

(A glimpse of Buddle the proud ship owner can be seen in the following entry)

<u>Wednesday 17th January 1838.</u> Went to Seaham Harbour and saw my two ships, the "Lord Seaham" and the "John Buddle",

they are both laden and ready to proceed to sea at the first favourable opportunity. Gave the apprentices of the two ships, 9 in number, each a watch coat to keep them comfortable during the winter. (Buddle, PB)

Not everyone was pleased with the success of Seaham Harbour and Buddle had unexpected problems with his new ship the "John Buddle" on its first voyage. The ship was reported leaking at Gravesend and he visited it on its return to Seaham.

> <u>Thursday 6th July 1837.</u> My new ship the "John Buddle" came into the Harbour in the evening from its first voyage to London. The leak was discovered to have been occasioned by three open bore holes in the flat of the bottom. They were nearly bored through the baulks, between the timbers. It is impossible to account for those holes being there, and a suspicion is entertained that they must have been bored with a malicious intention. The Captain Mr Spence is very much satisfied with the vessel, it is very handy and sails well, and came down with 35 tons of ballast – this is however decidedly too little except in very fine weather as it only put the vessel down to six and a half feet of water. The ship was immediately put under the spout to load and will go to sea again by six or seven o'clock in the morning. (Buddle, PB)

Sabotage was not the only dirty trick used against the new port at Seaham Harbour:

Thursday 8th October 1838. Met Messrs Ravensthorn, John Burrell, P Forster, and Davison of South Hetton Colliery with Spence at Seaham Harbour to investigate certain charges laid against them by Lord Londonderry for giving an undue preference to Hartlepool in shipping the South Hetton Coal there instead of Seaham. On a full investigation these gentlemen exonerated themselves from these charges and showed on the contrary that they had used their best endeavours to load their coal at Seaham, but could not get ships to go to the Harbour. The company have purchased five ships on purpose to load their coals at Seaham and Davison their fitter, has with his brother and others five more which he loads constantly at the harbour – making ten vessels in all which they load constantly there. But they cannot induce others to go, although they admit it would be greatly to their interest to ship all their coals at the Harbour.

(The problem was bribery) (Buddle, PB)

<u>Thursday 10th September 1840.</u> At Seaham Harbour, where the Vend of Eden Main coals is nearly suspended and North Hetton is quite at a stand in consequence of the coal owners of the Tyne, Hartlepool, and the Tees allowing the Captains of the Coast Vessels six pence per Chaldron. Mr Lee has got a great number of the Captains to sign certificates of the amount of money they have received in this way, and of who they received it. (Buddle, PB)

(Buddle (with Lord Londonderry behind him) was not to be crossed and they did not let the matter rest.)

<u>Friday 11th September 1840.</u> Attended a meeting of the Sectional Committee at Newcastle – the question of allowing 6 pence per Chaldron to the Coasting Captains at Seaham Harbour was mooted. (Buddle, PB)

With the evidence Buddle had collected and the threat of action by Lord Londonderry the Coal Trade Committee could do nothing about the introduction of a premium to load at Seaham and it came into force with great effect.

> <u>Tuesday 22nd September 1840.</u> At Seaham Harbour in the morning. A great number of light ships came into the Harbour. The six pence per Chaldron allowed to the Captains of the Coasters has procured plenty of vessels. (Buddle, PB)

The reason for the success of the harbour can easily be seen from Buddle's diary. Technically it was the best on the coast with the wet dock allowing a rapid turnaround of ships compared with tidal rivers. Buddle's aggressive marketing, lobbying coal owners and listening to their preferences (drops instead of spouts), made it popular with local collieries and with Lord Londonderry behind him he could use his position on the Coal Trade Committee to resist unfair competition and bribery. Ironically Buddle himself was very much in favour of the regulation of the output of collieries by the Committee, but as far as shipping was concerned he was all for free competition. The new port had the best offer and he knew it.

Buddle didn't live to see the final completion of Seaham, but he would undoubtedly have been delighted with the results of his efforts. After the death of Lord Londonderry in 1854 Lady Londonderry, Frances Anne Vane-Tempest, moved into Seaham Hall and devoted herself to the collieries and harbour. The impressive Londonderry Offices above the harbour date from her time and stand today as a monument to a remarkable woman who held her ground against her husband and to John Buddle who more than anyone else created the harbour.

Seaham Colliery was the scene of a fire in 1871 which brings back memories of John Buddle's days at Jarrow and Wallsend. At 11.30 pm on Wednesday 25th October 1871 a shot fired by Thomas Hutchinson triggered a violent explosion. The shock was felt on the surface and started a fire which threatened to get out of control. The manager Mr Dakers and Head Viewer Mr Corbett decided to seal the face to starve the fire of oxygen and save the pit condemning any survivors of the explosion to certain death. Twenty six men died, the number would have been much greater if the pit had been fully at work, and by the next week the colliery was back at work with the dead men still entombed underground. It is difficult to express the anger pitmen felt about the Seaham disaster and in the light of what happened at Seaham it is easy to see why the men respected Buddle after his actions at Heaton, Jarrow, and Wallsend to search for survivors and make sure victims got a decent burial. The bodies of the victims were not recovered until the 20th December almost two months after the explosion and long after the pit had returned to work.

In 1881 there was another disaster at Seaham Colliery. At 2.20am in the morning of Wednesday 8th September the middle seam at Seaham exploded blocking both shafts and cutting off the pits ventilation. Fortunately, if the deaths of so many people can ever be said to be fortunate, once again because of the time there was not a full shift underground and of the two hundred and thirty one men and boys in the pit one hundred and sixty four were killed. If a full shift had been underground the number of deaths would have been much greater. More than fifty years after the invention of the safety lamp explosions were still happening and the lessons of Jarrow, the infamous slaughterhouse, had still not been learned.

The Lost Main Line

The Leamside Line in County Durham has generally slipped into obscurity since it was closed in 1991 except for a few weeks in 2003 when a one mile section of the track at Pensher was stolen. The audacious theft was carried out by a former railtrack engineer using hired heavy lifting equipment and casual labour. The line had been mothballed since 1991 having been deemed surplus to requirements with the closure of the Follingsby Freightliner Depot which was the source of most of its traffic after the withdrawal of the last of its passenger services in 1964, but the track was left in place in the hope that it could at some time be reopened to provide a rail link to the new town of Washington. That seems unlikely now with the final lifting of the track in 2013 after eighteen years of disuse and the prospect of trains ever returning to the historic line must be remote.

County Durham has many abandoned railways, old colliery lines which closed with their pits and branch lines overtaken by the motor age, but the Leamside Line is different, it was once a key part of the East Coast Main Line which completed the missing link between Tyneside and Darlington via the spectacular Victoria Bridge over the Wear. The Leamside line was relegated to a secondary route with the opening of the line through Durham in 1872, but it still saw regular use as an alternative when the main line was closed for maintenance, and in the late 1980's it was used by High Speed Trains for a few weeks when the main line was electrified. I remember passing over Victoria Bridge on a train to London in 1989 and enjoying a spectacular view of the Wear and Pensher Monument from a train on one of the great railway bridges of Britain, something which unfortunately is no longer possible.

The Leamside line was John Buddle's railway, he surveyed the route and piloted the passage of the bill through Parliament acting on behalf of Lord Londonderry and Lord Durham, the major landowners along the line, and he supplied the stone for Victoria Bridge from Pensher Quarry. John Buddle was a witness to the creation of the national rail network symbolised by Victoria Bridge, a development of national rather than local significance. Buddle travelled frequently from Tyneside to London either on Lord Londonderry's business or to give evidence in court cases and Parliamentary Committees. He also travelled regularly across country to the Forest of Dean in his role as one of the three Commissioners regulating free mining in the Forest and his diary describes his journeys on a variety of different railways and the problems of early rail travel. Long distance travel in the 1830's before the connection of the many local railways into a national network was expensive and slow and usually involved mail coaches for some part of the way making most journeys a bit of an ordeal and definitely not something to be done for recreation or pleasure.

Usually Buddle started for London from Newcastle by the mail coach to Darlington or York and then took the train south. His first railway journey to London was from Birmingham to Euston Road in 1835 with most of the earlier part of the trip being made by mail coach. In the 1830's there was no easy rail route from Newcastle to Darlington so for most of his life Buddle had to start his journey by coach. In truth he preferred the intimacy of the mail coach to the train, travelling inside the coach with a few select passengers there was more opportunity for stimulating conversation and the chance to make useful new acquaintances, trains were often in his view too crowded and unreliable. The connection to the south was finally made in 1838 by the completion of Victoria Bridge by the Northumberland and Durham Junction Railway (it was originally known as Junction Bridge) which allowed trains to run through from Gateshead (the completion of the High Level Bridge and the linking up of the lines to the north, south and west at Newcastle Central Station was not achieved until 1844) to Darlington via Brockley Whins, Washington, and Ferryhill. The Northumberland and Durham Junction Railway ran over Lord Londonderry's land and Buddle was involved from the beginning negotiating with the proprietors on behalf of Lord Londonderry and surveying the route. Later he supplied stone from Pensher Quarry for the bridge itself, the stone being loaded into keels at Lambton Staithes and floated a short distance to the bridge site.

The great bridge was one of the wonders of the age, the line is 135 feet above the high water mark and the 160 foot main span over the river Wear was in 1838 the largest stone arch in the world, and its construction fascinated Buddle who followed every stage with great interest. Perhaps the bridge like Seaham Harbour represented for him something more permanent and enduring than collieries which by their very nature were only temporary features on the landscape. In the early 1830's Buddle started to regard himself as a civil engineer with the building of Seaham Harbour as his main activity and watching the great bridge growing daily almost within sight of his house and offices at Pensher it is easy to see why. Civil engineering was to him a noble profession far removed from the dark and dangerous pits in which he made his living and it produced structures which married utility and beauty, the two things he most admired.

> <u>8th December 1834.</u> Met Gregson in Newcastle to call on Clayton on release of parcels of land for Junction Railway. Mr Clayton requires the release of the Biddick parcel from the mortgage that Messrs Green and their Lessees, and Gregson undertook to see them for this purpose without delay. This being done Clayton will immediately pay me two thirds of the £1,400.

> Saturday 21st December 1835. Met Messrs Manners and Harrison, on Medomsley Colliery Business. They told me that they had not been able to let the building of the bridge over the Wear, and that the Junction Railway company would probably have to build it themselves, but that in either case they should take the stone from Pensher quarry. What they objected to was being bound to take the stone in the quantity and proportions I had stipulated. I explained that I only wanted to have the quarry worked fairly so that no waste of stone should be committed. They said they had wished for nothing more, consequently we

could not have any difficulty in agreeing. They said they would take all the waste stone from the quarry for ballasting the way, we to deliver at a point to be fixed. (Buddle, PB)

<u>Tuesday 24th May 1836.</u> At Pensher examined the quarry and the site of the large viaduct bridge over the Wear at Low Lambton. The coffer dam for the pier of the main arch on the north side of the river is nearly finished. (Buddle, PB)

Saturday 9th July 1836. In consequence of Pensher guarry not being able to furnish a sufficient supply of inferior block for the interior work of the bridge piers had a meeting with Messrs Woods, Harrison and Gibb at Newcastle. It seems there is no other way to keep the work going but to use up the first class stones for the interior work which will cause a loss of two shillings and six pence a ton, or six hundred pounds in all, and Mr Gibb proposed that he should loose two hundred pound, the Company two hundred pounds, and Lord Londonderry two hundred pounds. I was so pressed with matters of preparation for my journey to London that I could not enter fully into the matter of the question, but it was agreed that the work should not be stopped, and that the stones be cut to keep it going until I return, when the subject is to be fully considered. (Buddle, PB) Thursday 21st July 1836. At Pensher, saw Mr Gibb, and gave him permission to get a supply of stones from Gateshead Fell, as we

cannot supply him from Pensher owing to the want of Quarry Men. Have only 50 men in the quarry and it would require 100 to supply the quantity of stone required by Gibb for the bridge. (Buddle, PB)

<u>Wednesday 14th September 1836.</u> Spent the day at Pensher, examined the proceedings of the Wear Bridge at Low Lambton. The coffer dam round the pier of the main arch on the north side has not proved tight, the water having found its way through the sand at the bottom. They are therefore driving the piles further down. The pier of the main archon the south side is built several courses of stones above the foundation and the piles are driven for supporting the framework for the contouring on the south side of the river. Inspected Pensher quarry which is now in a fine state for providing stones for the bridge. (Buddle, PB)

<u>Tuesday 25th October 1836.</u> Examined Pensher Quarry and the operations at the Wear Bridge Low Lambton. Have got down to the foundation of the north pillar of the main arch within the coffer dam. The foundation is a bed of post about two feet thick lying on a bed of strong fireclay. The foundation is 30 feet below low water mark. The dam is formed of piles 40 feet long driven skin for skin, one tier on the land side, but three tiers on the river. The three courses next to the river have an interval of three feet between them which is puddle, the waterside silt having been

first cast out. The piles are shod with iron but could not penetrate the post. There is therefore a considerable leakage which the engine can keep during low water, but the tide is allowed to flow in so that at high water the dam is filled. Mr Gibb thinks this more prudent than to risk the bursting of the bottom of the dam by laying the full pressure of the tide against it. The dam is strong enough but the danger is that the water might force a passage under the bottom of the piles. The dam is well found with whole balks and does not seem to have felt any pressure. The south pillar of the main arch is up about 10 feet above high water mark. (Buddle, PB)

<u>Friday 25th November 1836.</u> Met Messrs Clayton, Manners, and Harrison at Newcastle, on the subject of supplying stone from Pensher Quarry for the Wear Bridge. As we cannot be certain of supplying a sufficient quantity I gave Mr Gibb leave to supply himself elsewhere to such an extent as he might require. (Buddle, PB)

<u>Tuesday 9th May 1837.</u> Examined the Junction Bridge over the Wear. The two piers for the main arch are both up to the springing and a few courses of the pen stones of the arch are laid on the south side. The centering of the main arch is up to the height of two frames on the south side but the framework of the north pillar for its support is not yet finished. The centering of all
the land arches on the south side is nearly completed and the turning of the three land arches is considerably advanced. Mr Gibb expects to finish the bridge by the first of January next. (Buddle, PB)

<u>Tuesday 4thJuly 1837.</u> Inspected the works at the Junction Railway Bridge over the Wear. All the pillars are up to the springing for the arches. The centering of the south side large land arch is finished and part of the pen stones of the arch laid. The centering of the main arch is about three fourths done and part of the arch on the south side built. (Buddle, PB)

<u>Monday 14th August 1837.</u> Lord Londonderry with Lords Seaham and Adolphus breakfasted with me at Pensher this morning. They walked down by the Whitfield Pit to see the Junction Bridge and returned to Seaham to dinner. (Buddle, PB)

<u>Tuesday 10th October 1837.</u> The turning of the large arch is finished and the centering of the 100 foot arch on the south side of the river was slacked on the 5th inst. Today the centering is being taken entirely out, and the arch is left to itself. Not the slightest yielding or shrinking is visible, nor has any flushing of the stones taken place. Everything seems so far as favourable as could be wished. (Buddle, PB)

<u>Wednesday 1st August 1838.</u> Spent the day at Pensher. Inspected the Junction Bridge over the Wear, it is quite finished and the railway is being laid over it. It is a noble structure. (Buddle, PB)

Thursday 23rd August 1838. Went to Pensher with Captain and Mrs Portlock and Miss Cunningham to see the opening of Victoria Bridge (Junction Bridge was named Victoria Bridge in honour of the coronation of Queen Victoria which took place on the 28th June). The locomotives (three) took a train of 120 laden wagons of Stewarts Steam Boat Wallsend (coal) from the Meadows Pit along the Bridge. No vibration was visible in the Bridge while the train was passing. One of the auxiliary engines in joining the rear of the train, near the Bridge, from some accident to the hand gear could not be brought up and went with such force against the rear of the train, as to throw it off the way. The jerk was so great as to cause such a confusion in the coaches attached to it that the passengers were thrown out of their places. Mr Williams the engineer had his shoulder dislocated, and Mr Cockerill had the small bone of his lea broken and several persons were severely concussed. The engine ran a considerable distance after being thrown off the way, and narrowly escaped going over the embankment at the south side of the Bridge. Had this happened the consequences would have been most disastrous. (Buddle, PB)

Despite the opening of the bridge in 1838 through trains from Newcastle to London didn't start running until 1844 when the High Level Bridge opened and Buddle usually travelled from Newcastle either by mail coach to Darlington or by train to Carlisle when he went south. The Newcastle to Carlisle railway was not one of his favourite lines.

> <u>Friday 15th September 1837.</u> Arrived at Carlisle at 5 o'clock this morning and left at quarter past seven by the railway train, and arrive at Newcastle at one pm. The unfinished part of the road from Greenhead to Haydon Bridge, 11 miles, on which passengers are conveyed by coaches causes great delay. This part of the line is expected to be finished next June or July. (Buddle, PB)

> <u>Monday 18th June 1838.</u> The Carlisle Railway was opened between Redheugh and Carlisle this day. I went to Blaydon with my two sisters and Bob and Mary Fryer to join the train there from Redheugh, but they were delayed in starting two hours, and when they arrived at Blaydon, the carriages were so crowded that we could not get comfortable seats, and the weather being dull and unpromising we gave up the idea of going to Carlisle and returned home. There were 12 engines and trains, besides a pilot engine, and an immense number of people were in the carriages. (Buddle, PB)

<u>Thursday 3rd January 1839.</u> Started by the five o'clock train this afternoon with Mr Sopwith on our way to Coleford, on the Dean Forest Commission. Did not arrive at Carlisle till nine o'clock, the train being much retarded at Wylam from want of steam, the cause of which was not explained. Found the railway very rough and uneasy, especially about Stocksfield, the motion of the carriage was incomparable more unsteady and uneasy than any common coach travelling I ever recalled to have experienced. Took the "Locomotive" Coach at Carlisle at nine o'clock pm. (Buddle, PB)

<u>Friday January 4th 1839.</u> Arrived at Preston at seven this morning and took the train at nine for Newton, where we arrived about ten, the distance being 22 miles. Found the railway very smooth and easy travelling, incomparably better than the Carlisle line. Started immediately by the train for Birmingham and arrived there a little past two pm, the roadway smooth and in good order. Sir Hugh Willoughby travelled with us all the way from Newcastle to Birmingham on his way to London. Took the Cheltenham coach from Birmingham at three o'clock, and arrived at Cheltenham at ten o'clock having been 25 hours on the journey from Newcastle. (Buddle, PB)

<u>Thursday 11th June 1840.</u> Started by the train from Newcastle at 5 pm for Carlisle on my way to London. Arrived at Carlisle at 8

o'clock and started at 9 by the North Briton Coach for Preston. (Buddle, PB)

Friday 12th June 1840. Arrived at Preston at a guarter to seven this morning. Breakfasted and started by the train for London at a guarter to ten. Arrived at Birmingham at 3 pm. Dined at the Railway Hotel Birmingham and started for London at 4 o'clock, the distance between the station at Birmingham and the terminus and station at Euston Square is 112 $\frac{1}{2}$ miles, which we ran five hours precisely, including stops at the stations. The line from Birmingham passed through the Counties of Warwick, Worcester, Northampton, Buckingham, Hertford, and Middlesex. It passed through the following places going from Birmingham within a mile Coventry, Rugby, Fenny Stratford, Leighton Buzzard, Birkhampstead, Watford, and Harrow. The greatest inclination on the line is 18 feet per mile except for that point between Camden Town and Euston about a mile in length where a stationary engine draws the trains up. There are 35,000 tons of iron rails in the line. There are seven tunnels on the line and seven stations viz. Coventry, Rugby, Blisworth, Wolverton, Tring, Watford, Euston Square. (Buddle, PB)

Buddle had been a pioneer of railways; in 1813 he commissioned William Chapman to build the locomotive now known as the steam elephant and at heart he remained a railway enthusiast all his life even if he thought at times coaches were more comfortable. On a journey from Cheltenham to Birmingham on Thursday 8th October 1840 he got a chance to ride on one of the American Locomotives used on that line.

> Thursday 8th October 1840. We dined at the Plough and took the five o'clock train for Birmingham. Just as the train was about to start Captain Moorsom the engineer came up. Mr Sopwith knew him and introduced me to him. He is a very agreeable intelligent person. I entered into conversation with him on the American locomotives which they employ on this line. We were drawn by one of them, the Victoria. He took Mr Sopwith and I upon the engine and we rode to Ashchurch Station, a distance of 7 ¹/₄ miles which allowed us the opportunity of seeing its operation. The dimensions of this engine were as follows: cylinders 11 inches diameter; stroke 20 inches; weight 8 $\frac{1}{3}$ tons; wheels 4 feet diameter; runs on 4 wheels – not coupled – only one pair driven. We came round a curve of a mile radius at the rate of 34 miles per hour. We came up an incline near Crofton which is upwards of 2 miles long with a rise of 1 in 37 being the greatest rise of any locomotive incline in England at present. We had two engines here, one before the other and ascended at the rate of 12 miles an hour, one engine can only ascend at the rate of six miles an hour. Our mean speed from Cheltenham to Ashchurch station 7 $\frac{1}{4}$ miles was 29.624 miles per hour. Captain

Moorsom attributes the superiority of the American Locomotive to an improvement in the shape of the orifice by which the steam is more quickly discharged from the cylinders by which both power and speed is obtained, the travelling wheels being small 4 foot gives the engine more power over them and enables them to go up ascents better. Captain Moorsom says the American iron for the fire boxes is not so good as the English as they blister more, and the tubes are copper instead of brass, which does not answer so well for burning coke. In wet or frosty weather they strew sharp dry sand on the rails to make the enaine wheels hold better, the sand is scattered on the rails by tubes fixed for that purpose. They have 10 or 11 of those engines on the line and 4 or 5 English. This was a splendid day in point of weather and made the travelling exceedingly pleasant. Captain Moorsom states the cost of the American enaines to be more than that of the English in the ration of 17 to 15, that is to say an English engine might be had of the same power for £1,500 as an American one which would cost £1,700. (Buddle,PB)

Changing trains was always a problem and on one occasion Buddle lost his luggage and was not impressed by the service at the station. By 1843 though things were getting much better and the first through train from Newcastle to London left the following year via the Leamside line and Victoria Bridge.

Monday 26th July 1841. I arrived at Birmingham (from Gloucester) at 10 o'clock and proceeded immediately in an omnibus to the London and York station. On arriving there a porter took my luggage, consisting of a portmanteau and a carpet bag into the passage, and laid it down. I told him I wished to be booked for York but he said the office would not be open and I could not get my ticket till a quarter to one o'clock. I then asked him what I should do with my luggage to which he said it will remain quite safe here, you need give yourself no further trouble about it. I said very well then I will go to the refreshment rooms and wait till the ticket office opens. I did so but on returning to the office to take my ticket and look after my luggage it was nowhere to be found and no one could give any account of it. All I could do was to give Smith the inspector a description of it. He thought it might have been sent off by the London train which started about half an hour before, and promised to make every inquiry about it, and I was obliged to proceed without it, much to my annoyance. (Buddle, PB) Saturday 17th June 1843. Started from Newcastle by the "Telegraph" Coach at a quarter to eleven o'clock this morning

to Darlington, on my way to London. Took the train at Darlington

for London, the same carriage now takes you all the way, which is a great convenience as you never have your luggage to remove. (Buddle, PB)

Politics and Personality

John Buddle was as near to an atheist as it was possible to be comfortably in the Nineteenth Century when religious devotion was taken for granted. He was a member of William Turner's Unitarian congregation in Newcastle and although he often went to other churches the only comments about religion in his diary are about the quality of the music and signing.

> <u>Sunday 13th January 1839.</u> Went to the evening service at Coleford Church. The perpetual curate Mr Dowell read prayers, Mr Douglass the curate preached, a bad organ and worse organist, the singing worse than before the organ came into view. (Buddle, PB)

As a scientist Buddle believed that science could explain human character and behaviour just as it could explain the natural world and he was particularly interested in phrenology which seemed to offer the possibility of understanding human character from the shape of the brain. In 1836 he went to a lecture on phrenology at Newcastle and copied down verbatim in his diary the founding principles of the new "science":

Saturday 27th February 1836.

1st. That the brain is the organ of the mind or the instrument by means of which the mind acts and is sited in this world.

2nd. That different parts of it serve to manifest different faculties of the mind and, in particular that the propensities and feelings common to man and the lower animals are connected with the lateral, and basilar proportions of the middle lobe and the entire posterior lobe, that the moral and religious feelings are connected with the upper portion of the middle lobe, and that the intellectual faculties are connected with the anterior lobe.

3rd. That the size of the brain influences the power of manipulating the mental faculties, so that extreme deficiency in size is one cause of idiocy, and large size, cortex particular, is accompanied by powerful manifestations, and that this holds good in regard to the parts of the brain and the special faculties which they serve to manifest.

4th. That the particular feelings and intellectual faculties manifested by particular parts of the brain have to a considerable extent been ascertained by observation. We do not here enumerate the faculties and organs which we consider to be ascertained, because we differ in regard to the precise number of them, some of us being satisfied as to more and some of us as to fewer, according to our different opportunities of observation, and because the foregoing propositions numbers 1, 2, and 3 necessarily imply all that it is the object of the present declaration to accomplish, namely to induce the public to study the subject for their own information.

5th. That phrenology is essentially the doctrine of the physiology of the brain, and useful towards a right understanding of the functions of the nervous system in general, and of insanity and other mental diseases in particular.

6th. That we consider it calculated to be useful also in the advancement of education and in all that relates to the moral and physical improvement of Man. (Buddle, PB)

It is safe to take this detailed quotation as indication of approval. Buddle did not waste his time recording ideas which he believed were erroneous or false in his diaries. There is a further account of phrenology in his diary in 1843:

> Saturday 12th August 1843. Went in the evening to the Albion Hotel (Chester) to hear Mr Spencer J Halls lecture on Mesmerism and Phrenology. He first operated upon a boy about ten years of age belonging to some person of respectability in the town. He set the boy upon a chair, he took the boys two thumbs in his hands standing before him, and desired the boy to look upwards fixing his eyes steadily upon the ceiling. He then waived his hands a few times round the lads head, and lastly placed his hand before the lads face , extending the first and second fingers, and the third and fourth of his right hand, opened like a pair of compasses, on each side of the lads nose. The lad's eyes while looking upwards looked stupid and glazy and his countenance assumed a ghastly and unpleasant aspect. But when the operator placed his fingers on each side of

the boy's nose his eyes began to close and he looked very drowsy and presently his head fell and he appeared to go into a sound sleep. He then placed his fingers on the boy's shoulders which instantly threw the arms into a catalytic state and they were extended in a horizontal line direct from his shoulder, they were quite stiff. By touching the arms on the underside near the armpits with a little pressure the arms fell and assumed their natural flexibility. He then touched the organ of divination (part of the head, phrenology associates bumps on the head with psychological characteristics), when the boy went upon his knees and said the Lord's Prayer. He touched the organ of acquisitiveness and the boy immediately began to pick his pockets. He touched the organ of benevolence, and the boy picked his own pockets and put what they contained into Mr Halls. Mr Hall touched in succession the organs of tune, selfesteem, friendship, and combativeness all of which the boy distinctly manifests this. When Mr Hall touched the organ of tune, having a musical box in his hand, the lad followed him all around the stage endeavouring to get hold of it and when Mr Hall put it on his head the lad clambered up and made great efforts to get at it... (Further demonstrations followed)... This Mesmerism is certainly a very curious phenomenon to say the least of it. Mr Hall was a plain respectable looking person

without the least show of trickery about him. He said persons of nervous temperaments were most susceptible to its influence, and that some persons could not be Mesmerised. (Buddle, PB)

The idea of a science of the mind certainly appealed to Buddle who valued facts above everything else. Phrenology which linked feelings and emotions to physical parts of the brain was essentially a materialist philosophy which fitted in well with Buddle's view of the world where everything was governed by mathematics and physical laws.

> <u>19th February 1836.</u> Letter from Dr Dalton. I received your letter and bottles of gas safely and soon after opened the bottles under water. The air in each bottle was very much alike. It was constituted of some two or three per cent of Carbonic Acid, about one tenth common air rather short of Oxygen, and the rest about eighty five per cent was pure carburetted Hydrogen or pond gas (methane) without a trace of the pure Hydrogen or defiant gas. (Buddle, PB)

Buddle believed that if human character could be examined and understood in the same way as mine gas then Society could be properly ordered. How he thought this might work can be seen in his detailed description of Middlesex Asylum. Here there are no cures and every person has a task according to their ability, with the worst cases being simply prevented from injuring themselves. The Asylum is run by a benevolent caring person who knows what is best for the residents and uses the latest technology for heating and lighting. Above all it is clean and well ordered, and the inmates are well fed and clothed like members of an ideal society organised along rational principles.

> Tuesday 21st June 1836. Visited the Middlesex Asylum for pauper lunatics at Hanwell with Donkin. This place is situated on the road about twelve miles from London. The asylum is under the management of Dr. Ellis and his wife Lady Ellis who reside in the house. It is an extensive building, and is said to have cost £150,000 including 55 acres of land. It is devoted exclusively to the maintenance and care of pauper lunatics of all ages and sexes. It is calculated to hold 600 patients, but there are now 615 in it and it is always full. The wards and every part of the establishment are n the cleanest and best order possible and the patients are well clothed with clean linen and look as well as possible considering their unhappy condition. The number of female patients exceeds the males by about 100. They are all classed according to their degrees of insanity, and the best of both sexes are permitted without compulsion to assist, the women in the domestic affairs of the house and the men in the farm and gardens. By this means one Cook and one Laundress manage the establishment. Ten keepers and twelve nurses with the aid of the more sane individuals manage the rest of the patients. The patients are treated with the utmost kindness and

coercion is never used but in cases of absolute necessity. Solitary confinement, strait jackets, and fetters are the means of restraint resorted to but very few indeed were under these restraints. In the very worst cases where all consciousness was lost the patients were seated in a kind of chair with close back and sides and a sort of railing in front as high as the chest. The legs can be stretched under the railing but the patient cannot rise into an erect position. And the arms are secured by a short waistband so that although the patients may roll about in their seat they cannot injure themselves. The County allows five shillings and eleven pence per week for the maintenance of each patient and their diet consists of mulch porridge for breakfast and supper, and they have four flesh meat days during the week, the other days they have soup and puddings to dinner. They are also allowed Beer which is brewed in the house with a steam engine to pump the water, grind the malt and work the washing machines. The patients who are well enough to assist the domestics are allowed to associate and live with them, and to enjoy the indulgence of tea etc. with them. The patients sleep all in single beds except when two women by choice sleep together. The women have no particular costume but the men wear a dark grey dress. From thirty to fifty patients are in one Ward and each Ward has a spacious day room and

yard for the patients to take air without restraint. The apartments are lighted by gas and warmed by steam passing through cast iron pipes. A surgeon and his wife live in the House as well as the physician. There is a chapel in the House, in which a clergyman of the established church does duty every Sunday afternoon and prayers are said every morning at 8 o'clock by some of the household. The majority of cases among the women arise from gin drinking and most of the cases are long standing and few cures are made. The mode of treatment seems most judicious, every means are used to assist the attention and employ or amuse the mind with exercise, work, or amusement in the open air. Some of the men amuse themselves by pleating straw, others make cages and rabbit houses, and one man takes care of the cows. He delights in them and pays as much attention to them as if they were his own, or perhaps more. The women have various occupations as needlework of various sorts, making hoops, straw hats, and strawberry bottles etc. Also weeding and hoeing in the garden and farm. Lady Ellis is an extraordinary clever woman, and seems zealous almost to enthusiasm in her attention to the patients and her kind and soothing manners has attached them to her in a most astounding degree. She knows every individual by name and converses with them all with peculiar good humour and tact according to their respective states of mind, and they are all evidently attached to her. She possesses great talent and judgement in finding out the sort of employment or amusement best suited to each case. One girl was allowed to turn a mangle constantly, and another to hoe in the garden as if not employed in that manner they would tear their clothes to pieces. Some of the men were working carpenter work. The perfect cleanliness of every part of the establishment was truly surprising and at the same time gratifying. (Buddle, PB)

Notice he says most of the female patients, indeed the majority of all patients, were in the asylum because of Gin drinking. This was for him a symbol of the natural tendencies of the lower classes to disorder. When proper understanding and controls were lacking the result Buddle feared would be chaos which benefitted nobody, least of all the pitmen, an opinion strongly reinforced by his unhappy experience of the 1832 strike at Wallsend and Jarrow. Even on festive occasions like the Coronation of Queen Victoria it is possible to sense his unease in the presence of large crowds of ordinary people and his worry that it was all too easy for such public celebrations to turn to disorder and violence.

> <u>Thursday 28th June 1838.</u> This being the day appointed for the Coronation of Queen Victoria Mr John Griffith of the Ordnance Office invited me to his house in St James Street to see the procession pass. The day being fine the spectacle of the

procession was seen to a good advantage and it was most splendid. I saw it to great advantage from a window in the second floor, but the situation was too high to allow me to see the Company in the Carriages. I did not, therefore, get a good sight of the Queen either in going to the Abbey or returning on the latter occasion. I only saw her hand with the sceptre in it and the lower part of her person as she sat in the Carriage, but I could not see the Crown. The concourse of people which were assembled on the occasion was prodigious, galleries were erected in the front of the houses, the windows were filled, and the leads and roofs were also filled. The streets were completely crammed yet everything was so well conducted by the police and military that perfect order was preserved and no accident happened. We walked through St James and through the Green Park to Hide Park to see the Fair – the whole area of the Park from Apsley House to Cumberland Gate was filled with people and appeared when viewed from an elevated situation like a living ocean of human beings. At half past ten in the evening there was a grand display of fire-works in the Green and Hide Parks. I witnessed the former, which far surpassed anything of the kind for magnitude, brilliancy, and variety I ever saw. The enormous mass of people which were moving in the streets to see the illumination was astonishing, but all were in good

humour, and no squabbling or rows took place so that everything passed off as pleasantly as possible notwithstanding the great pressure of the crowd on the sides of the streets and the double and triple rows of carriages in the middle. The evening was remarkably fine which greatly added to the splendour and comfort of the whole spectacle. (Buddle, PB) Saturday 27th August 1836. Attended the ceremony of the laying of the foundation stone of the suspension bridge over the River Avon at St Vincent's Rocks this morning at 7 o'clock. The stone was laid at 8 o'clock. An immense concourse of people assembled on the occasion. A great number of colours were hoisted on the banks of the river, as well as in a multitude of boats on the river. Several bands of music attended and cannon were fired from various parts. From the peculiar form and height of the rocks at this part and their allowing people to stand on their numerous escarpments and shelving's the scene was exceedingly interesting and imposing. (Buddle, PB)

Buddle's diaries are full of practical politics. He actively sought information about miners unions and union leaders and vigorously opposed unions in his collieries. He was much in demand as a consultant and gave evidence to Parliamentary Committees on everything from pit disasters to child labour and acted as one of the three commissioners for the regulation of free mining in the Forest of Dean. There is no doubt he enjoyed his official duties, but he actively disliked politics. Often his involvement stemmed from his role as Lord Londonderry's agent or the Chairman of the Coal Trade Committee, and what emerges from the diary is an essentially pragmatic man negotiating his way through a complex web of vested interests. On his own behalf he was certainly in favour of regulation of the qualifications and training of enginemen in mines and he attempted to set up a school of mines at Durham University, but the regulation of child labour in mines was a much more contentious issue and he didn't want to get personally involved.

> Saturday 18th June 1842. Called upon Lord Ashley this morning. His Lordship received me very courteously, and discussed the subject of the proper age for lads going to work in the pits and for engine men with great fairness and candour. But he was exceedingly tenacious of his opinion of thirteen being the proper standard for lads to be sent down the pit. I argued for ten and after much discussion and reasoning his Lordship agreed to make the standard ten provided we would only allow them six hours for their days work or only to work three days a week. And he offered to compromise the matter at once with me on those terms. This I declined to do, not thinking it prudent to take such a degree of responsibility on myself and therefore begged his Lordship to leave the matter open till our meeting with Messrs Bell and Lambton on Monday next. With respect to the age of enginemen his Lordship agreed to alter the clause in the Bill

which prohibits any person under the age of 21 working an engine to any person under the age of 21 having the full charge of an engine and he gave up the idea of fixing any limit to the age for (under supervision) leaving it to the discretion of the chief engineer. I suggested to him that enginemen should be bound as apprentices for three years and that it should be made compulsory that all engines used for drawing coals or minerals out of mines should be furnished with alarm bells and friction brakes. His Lordship immediately adopted those suggestions. His Lordship seemed very anxious that the compromise above stated relative to the ages of lads and their hours of labour should be agreed by the coal owners and any opposition in the House avoided, as in this case he apprehended that the Government would be against him and the Bill would be thrown out. The effect of this would be to keep the Country in a state of excitement for another session, as he was determined to persevere and had no doubt that in this end he would succeed. I called upon Lord Londonderry after I left Lord Ashley and told him the particulars of my interview with Lord Ashley. (Buddle, PB)

<u>Monday 20th June 1842.</u> Waited upon Mr Bell this morning and discussed the subject of Lord Ashley's Bill, and agreed to recommend a compromise on the terms I had talked over with

Lord Ashley last Saturday when we should meet this afternoon at the House of Commons... Attended a meeting at the House of Commons at half past four this afternoon to peruse Lord Ashley's Bill and to endeavour to get him to modify it so that it might pass the House of Commons without opposition. Present Lord F Egerton in the Chair, lords Wharncliffe, Ashley, and Henry Vane with Messrs Bell, Liddell, Bowes, Lambton, Lock, Grainger, Bratherton. (Buddle, PB)

<u>Tuesday 21st June 1842.</u> Waited on Mr Bell this morning and discussed Lord Ashley's Bill with him... Met the following parties at the Home Office at one o'clock and had an hour's discussion with Sir James Graham on the various clauses of Lord Ashley's Bill.

Lord H Vane, Mr Liddell, Mr Bell, Mr Lambton, Mr Wilbraham, Mr Ainsworth.

Sir James Graham entered fully into the subject of the limitation of the ages of the pit boys and engine men and showed great tact and knowledge of the subject. Although he did not commit himself he evidently disapproved of Lord Ashley's notions as to the limitation of the age and number of working days for the pit lads and made many pertinent and sensible observations on the whole bearing of the question. Mr Ainsworth stated that as it required two small boys to each collier to carry away the coals from him in his thin seams the limitation of the age of the boys working to ten and to working only every other or alternate days would stop his Colliery. He was therefore bound to oppose the Bill. From the Treasury I went to Holderness House to see Lord Londonderry but met his Lordship in Piccadilly. He told me that he would advocate nine as the proper age for small boys to be trappers and that he would be very cautious in using my name in addressing the House of Lords. (Buddle, PB)

Lord Ashley's Bill was passed on the 10th August 1842. It prohibited the employment of women and girls underground and restricted the age at which boys could be employed to ten. The provisions for the restriction of the number of days worked or the hours that could be worked discussed in the compromise with Buddle were defeated. Woman and girls were not employed underground in north east collieries so that provision was not contentious on Tyneside. In the new deep collieries like Wallsend and Jarrow the employment of boys was increasing as the complex ventilation systems needed lots of trappers at the many doors which controlled the air course. Buddle's view of this was clear; boys were better and more reliable than old men who tended to fall asleep. Neglect of the doors could cost dozens of lives. Famously Buddle also said he went down the pit at the age of six and declared that without the education or experience of working underground as boys the breed of pitmen would be weakened, but his view was not as simple as it is sometimes represented. He supported Lord Ashley's restrictions on the number of hours and the number of days under thirteen's could work, and was in advance of most of the coal trade in his views. Perhaps he remembered the disasters at Jarrow and elsewhere which were caused by children leaving doors open, and if children were to be employed safely they had to be alert and competent.

At a local level Buddle was deeply involved in politics as Lord Londonderry's agent, and here his actions were often in opposition to his own personal views. Buddle was a Whig with some radical leanings not a Conservative as is often thought, but as Lord Londonderry's colliery manager he was expected to publically support his lordship's politics. Buddle often said he wasn't interested in politics which meant he didn't want to get involved personally in local political squabbles which he saw as Lord Londonderry's personal domain.

> <u>Thursday 25th July 1837.</u> (Lord Londonderry) implored the persons present to exert themselves night and day to procure Mr Liddell's return as if they should fail in this Lady Londonderry and himself had made up their minds never to set foot in the county of Durham again. (Buddle, PB)

> <u>Thursday 3rd August 1837.</u> Attended the nomination of the Candidates Messrs Lambton, Liddell, and Chaytor for the Northern Division of the County of Durham. The show of hands was declared to be in favour of Lambton and Liddell. An

immense number of Lord Londonderry's and Lambton's pitmen attended but everything passed off quietly. (Buddle, PB)

<u>Thursday 10th August 1837.</u> Went to Durham to attend the choosing of Messrs Lambton and Liddell. An immense number of people attended. Lady Londonderry with Lords Seaham and Adolphus, and Lady Frances attended the proceedings. After the choosing Mr Liddell, Mr Frever, Mr Johnson, Lord Seaham, and John Wright spoke. All of the speeches were of an exulting nature in what they termed a great victory over the Whigs, and Mr Frever indulged in very abusive language against Lord Durham and the ministers. (Buddle, PB)

In the 1837 election Buddle voted in his constituency of Newcastle for the Whigs and thought it prudent not to be at the Conservatives celebration dinner as he could not approve of their politics. Lord Londonderry's politics were personal and emotive and in the 1843 election his Lordship got himself into a state about a supposed personal slight and ended up supporting the Radical Candidate John Bright in Durham which must have brought a wry smile to Buddle's face.

> <u>Monday 27th March 1843.</u> Received a letter from Lord Londonderry to inform me that Captain Fitzroy having been appointed Governor of New Zealand must vacate his seat at Durham and his Lordship wishes Lord Dungannon to succeed him. His Lordship therefore wrote me confidentially to call upon

Mr Morton and endeavour to get him to prevail with the Lambton Trustees not to oppose him. (Buddle, PB)

Lord Dungannon was duly elected, but later unseated after being found guilty of bribery. In the by-election the Conservatives selected a candidate without Lord Londonderry's prior approval and his Lordship decided to support the Radical candidate instead.

> <u>Sunday 23rd July 1843.</u> With respect to the Durham Election Lord Londonderry decided not to support the conservative Candidate on account of the very unwholesome manner in which he conceived Purvis and his friends had behaved to him and he wished Bright to be returned, as it would place the Wynyard interest in a better position against the next vacancy. (Buddle, PB)

> <u>Tuesday 25th July 1843.</u> In consequence of Lord Londonderry's freemen having voted for Mr Bright that Gentleman was returned by a majority of seventy eight, the numbers being for Bright 488 and for Purvis 410. This conversion of Lord Londonderry caused a great sensation among the Tories. (Buddle, PB)

Buddle reports his Lordship was received very coolly at the next magistrates meeting by his Conservative colleagues, and that there was hostility towards him for some time after. Buddle himself was certainly pleased at the result; he attended a meeting of the Anti-Corn Law League in Newcastle on the 20th January 1843 and found the speeches of Cobden and Bright compelling.

Friday 20th January 1843. Attended the soiree of the Anti-Corn Law League deputation consisting of Messrs Cobden, Bright, and Col. Thompson. The celebrated George Wilson was also present. Dr John Fife was in the chair. The company was very numerous; the Roon Music Hall became full. Tea was first given for one shilling to five hundred people before the doors were opened to the public which did not take place until six o'clock, tea having been served at five o'clock. The business of the meeting commenced at seven o'clock. Dr Fife explained the occasion of the meeting in a brief but neat speech and called upon Col. Thompson first to address the meeting. Mr Cobden, Mr Bright, and Mr George Wilson followed in succession. Their speeches were all excellent, in point of argument, and were delivered in the first style of oratory, and met with unbounded applause. An attempt at interruption was made by some half dozen Chartists but they were immediately put down. (Buddle, PB)

For most of his working life Buddle, first as a member, then later as Chairman of the Coal Trade Committee, worked towards the continuation of the regulation of the Coal Trade. As Lord Londonderry's Colliery Manager he could hardly do anything else but he seems to have genuinely believed that the regulation of production and prices was in the interest of the "best" collieries. By 1843 it was increasingly obvious that the collapse of the regulation was imminent, and he had a plan for the "best" collieries to combine together to fix prices in the interest of producers. This hardly seems the action of a man with radical leanings, but it must be remembered Buddle was above everything else a practical man who tried to make the best of every situation.

Little is known about Buddle's private life. So far as marriage was concerned socially his sister filled the role of a wife although there is no suggestion that their relationship was in any way sexual. Buddle enjoyed the company of powerful men and had a wide circle of male friends, but there is no indication he had any close relationships with women. His descriptions of Frances Anne Vane-Tempest and her daughter Frances later Duchess of Marlborough suggests he admired powerful and talented women and probably had an idealised view of femininity. Some entries in the diary also suggest his distaste for the crude and explicit sexual innuendo common in social gatherings of army officers, and perhaps his revulsion for the more physical side of sex.

<u>Friday 31st March 1843.</u> At Newcastle, went to the Theatre in the evening to see the play of She Stoops to Conquer performed by amateurs, the officers of the garrison and Mr R J Brandling. The performance on the whole was very good, particularly Mr R J Brandlings Long Lumpkin. He played the character with great spirit and evidenced great dramatic talent. Between the play

and the farce Mr H Brandling danced in burlesque, Cashuska ala Downey in female attire. He showed great agility but the performance was rather coarse. Raising the Wind was the farce; the part of Sam by Mr R J Brandling was very well played. But the performance was suddenly stopped before it was finished by it was said Captain Foster of the Royal Horse Artillery, who played Jeremy Diddler getting drunk. (Buddle, PB)

Saturday 19th March 1842. In passing along the Strand my notice was attracted by a placard with the words Extraordinary Female Curiosity in large letters upon it admittance one shilling. A Frenchman took me upstairs and after a short pause and calling to some person within I was ushered into a room entirely devoid of furniture, but in one corner stood a figure in white female attire upon a pedestal making its height equal to mine although the figure itself was only about four and a half feet high. I was rather startled to observe the head of a man with a very thick bushy black beard upon this figure. The face had the appearance of a man of 48 years and the voice was strong and masculine. The feet and ankles were those of a female very neat and small. The body and bosom and neck were those of a female as were the arms down to the elbows, but the fore arms and hands were those of a man as was the head and face as already described. The creature told me it was a Swiss by birth

and that it was a complete hermaphrodite. For five shillings it offered to show me the organs of generation which it said were quite perfect for both sexes. I however declined this being quite satisfied and disgusted with what I had already seen. (Buddle,PB) QED

In 1841 John Buddle met John Coutts a shipbuilder from Aberdeen on the train from York to London. For Buddle it was a fortunate encounter, Coutts was a pioneer iron shipbuilder and Buddle was an admirer of his work. Following that chance encounter Coutts moved from Aberdeen to Wallsend and established an iron shipbuilding yard close to Buddle's home Wallsend House. It seems likely that it was Buddle who persuaded Coutts that his future was on Tyneside and saw the potential for iron colliers in the coasting trade. At that time coal was still carried in wooden sailing ships which had to load tons of ballast for the trip back to the north east from London. Loading and unloading ballast took time and as a ship owner Buddle knew that a quick turnaround meant more voyages and more profit. That was what the wet dock and new drops at Seaham were designed to do. Coutts gave Buddle the answer to the final problem of ballast: iron steamships with water ballast that could be taken on and discharged with a simple pump. It was simple and cheap and the potential of steamships dominated the last years of Buddle's life as he approached his seventies with his passion for technology still undimmed.

> <u>Monday 17th May 1841.</u> Arrived (in London) after a pleasant journey (from York) at half past five this morning and got to the Tavistock a few minutes before six. Mr R H Brandling, Thomas Hall, Mr Grainger the Barrister and Mr Coutts the iron shipbuilder, who built the Garrow, the Vulcan and several other iron ships

were my travelling companions. The latter is a very intelligent person and I got a great deal of information from him on the subject of iron ships – particularly as to the ballasting of them with water. (Buddle, PB)

Buddle who lived most of his life on the banks of the Tyne at Wallsend had always been interested in ships, but the building of Seaham Harbour gave a focus to his interest and with the development of iron steamships he could have been back in the early years of the Nineteenth Century when the development of the steam engine seemed to offer limitless possibilities for economic growth and the birth of new industries. Whenever he could he went to look at ships like in this account slave ship at Liverpool and the Victory at Portsmouth.

> <u>Sunday 30th August 1835.</u> Spent the day at Liverpool in examining the docks: Saw a pirate vessel, a Brig, the Royal William, which had been taken somewhere in South America some time ago, and the crew were hanged for various acts of piracy. Saw also a slave ship, a Spanish brig of War, which had been taken by the Buzzard Sloop of War, on the coast of Africa with 800 slaves on board. A deck was laid out three and a half feet below the main deck on which the slaves had been confined. Cast iron ballast lay in the bottom of the hold, upon which a row of large casks, for fresh water, fitted to the hold lay.

The vessel was slightly trailbond and said to be a remarkably fast sailer. (Buddle, PB)

<u>Wednesday 19th June 1840.</u> We next went on board the Victory a 98 gun ship. It is not intended that this ship is to go any more to sea but she is kept in clean good order with 100 men on board and has jury masts. A brass plate six inches in diameter is let into the quarter deck on the spot where Nelson fell with the words "Here Nelson Fell" engraved on it. We went into the cockpit, and saw the place on which the hero died – it is a dismal den. (Buddle, PB)

As a member of the British Association Buddle had the chance to keep up to date with new technology and meet the pioneers. At the meeting of the British Association in Bristol in August 1836 he went to the mechanical section for a lecture on steam navigation.

> <u>Thursday 25th August 1836.</u> Dr Lardner gave a long lecture on steam navigation and the practicability of adopting it as a means of communication between England and America. The Dr stated seven and a quarter miles per hour to be the average speed of steam vessels taking all chance of wind and weather at a consumption of 9 pounds of coal per horse power. The direct line from Bristol to New York is 3,500 miles and if you allow one tone of coals for every 1,300 miles per horsepower the

distance was far beyond the limit for which coals could be carried... (Buddle, PB)

A certain Mr Brunel was in the audience and he didn't agree with the Drs Calculations:

Mr Brunel contended that Dr Lardner had taken his data of calculation from the performance of the smaller class of steamers used as Packets between Falmouth and Corfu, and that he had not availed himself of the recent. Brunel maintained that with the longer steamer now building at Bristol of 1,600 tons and two engines of 200 horse power each the accomplishment of the voyage direct from Bristol to New York was perfectly practical. Brunel went into calculations to prove this, and had in my opinion by far the best of the argument. (Buddle, PB)

Brunel's steam ships form one of the threads running through Buddle's diary as he passed through Bristol regularly on his way to the Forest of Dean for his duties as a commissioner of the woods (one of the regulators of the free miners of the Forest of Dean) and he always made a point of checking on their progress.

> <u>Wednesday 13th September 1837.</u> The Bristol steam ship now having her engines put into her in London – has two engines each with a seventy three and a half inch cylinder, and a seven foot stroke. (She) has four boilers but three only in use at the same time – one being cooling, cleaning, and repairing as may

be necessary. The salt saturated water is regularly purified out of the boilers instead of being run off at intervals. The vessels tonnage is (1,600 tons), the engine is 400 tons, consumption of coal 30 tons a day – will carry 900 tons or thirty days consumption. The average speed assumed is 9 miles an hour will reach New York in 15 days. (Buddle, PB)

This was the "Great Western" a wooden paddle steamer which made her first crossing of the Atlantic in April 1838 taking just 15 days to get to New York. Brunel of course had more ambitious plans and by 1840 his next ship the much larger "Great Britain" was under construction at Bristol.

<u>Friday 3rd July 1840.</u> We then drove by the new road up the riverside into Bristol, saw the docks, and on the opposite side saw the large iron steamer building for the Great Western Steam Shipping Company. This will be the largest steam ship yet built, but we had not an opportunity of going into the yard to examine the vessel. (Buddle, PB)

<u>Sunday 25th October 1841.</u> Mr Hartford took Messrs Sopwith, Stephenson (R), and myself to see the great iron ship which is building by the Great Western Steam Ship Company. This vessel is indeed a most stupendous stature, and is in a great state of forwardness, the shell being nearly finished to the Gunwale. A large opening is left in the larboard side for the convenience of getting the materials in for building the boilers, putting in the
bulkheads etc. etc. and the stern is unfinished to allow the propelling apparatus and the engines machinery being fixed. The company have erected an immense large fitting up shop with lathes, boring mills, planning machinery etc. etc. of the most improved construction, and are fitting up the engines for this ship. There are to be four cylinders, the united power of which will be 1000 horses and the work is considerably advanced but it is supposed that the vessel will not be completed before the end of 1842. The engine work is finished in the most superb style: the air pump brackets are made entirely of brass. The following are the dimensions of this ship as given to me by the superintending engineer:

Length on deck 336 feet

Length on keel 288 feet

Greatest breadth 54 feet

Depth of hold 32 feet

Weight of iron in Hull 800 tons

Thickness of bottom plates seven eighths of inch top five eighths To be propelled by an Archimedes Screw driven by flat rope bands – for this purpose the cylinders are placed in the sides of the vessel opposite each other in pairs sloping at an angle of between 50 and 60 degrees. They have been experimenting on the screw propeller and have so far satisfied themselves of its superiority as to lead them to the expectation that it will drive the ship in smooth water at the rate of 13 or 14 miles an hour; the ship is built in a dock so that when she is finished the water will be let in and float her without being launched. (Buddle, PB)

The "Great Britain" was launched in July 1843, but not completed until December 1844 after Buddle's death. The ship Buddle describes below is the "Great Western" now rebuilt and at almost 252 feet long and 1,700 tons the largest wooden ship in the world. She more than justified Brunel's confidence in his Atlantic Steamship line and made 45 round trips to New York before being taken out of service when the Great Western Steamship Company failed as a result of the stranding of the "Great Britain" in 1846. The Great Britain by contrast was plagued by technical problems with its Archimedes screw propeller and was no faster than the "Great Western". Unreliable and unpopular with passengers the "Great Britain" only ran on the Atlantic run for one season and her stranding in Ireland in her second season brought the company down.

> <u>Saturday 5th August 1843.</u> In crossing the Mersey we passed the Great Western steam ship just ready for sailing for America. She is an immense vessel but looked rather lower in the water than I should have expected, and was trimmed by the head away, i.e. deeper in the water at the head than the stern, which did not look well, but it is said she sails best in this trim. (Buddle, PB)

Buddle's interest in steamships was not idle curiosity or academic. He saw their practical application. The modern harbour at Seaham, fed by a network of railways depended on a fleet of wooden sailing ships which could be prevented from entering port or held in the harbour for days by contrary winds. Sailing ships depended on ballast, stones and sand, which had to be loaded at the start of each light voyage and unloaded at the end doubling the amount of time the ships spent in port. Iron steamships with water ballast cut the turn round time by half and were cheaper and more durable than wooden ships. For Buddle they were obviously the future; he was already an admirer of John Coutt's before he met him on the train and his diary describes several visits he made to inspect Coutt's ships.

> <u>Monday 30th March 1840.</u> Went to Howdon with Donkin and Robert Atkinson to see the large iron ship, the John Garrow, which is loading a cargo of W Hartley Coals for Bombay. This is a beautiful vessel of 800 tons measurement built at Aberdeen, entirely of iron, with the exception of the deck beams and planks and some flooring deals in the bottom of the hold. She is to take in 40 keels of coals and a quantity of glass crates, about 1000 tons of actual weight, and even then there will be a great deal of room left. This arises from the small scale of the iron ribs and scanchions and not being ceiled – that is to say she has only an outside skin. The outside skin is made of boiler plate in about five and a half or six foot lengths and 18 or 20 inches

broad. The joints are not overlapped as in boiler building, but are flush with a narrow strip of plate inside to which the plates are riveted – the heads of the rivets being countersunk on the outside. Their interior joint pieces form the inside of the vessel into a sort of panel work. The standing rigging is made of iron wire – not twisted but bound together by an outside lapping of a cloth prepared with cabuchoue, and tarred yarn. The mate told me that the whole weight of the rigging did not exceed five tons, it had a much lighter appearance than rope rigging. (Buddle,PB) Monday 1st June 1840. Called at Wearmouth to see the new iron ship the "Vulcan" built at Aberdeen by the same person who built the John Garrow. This ship is built differently to the Garrow as her plates are overlapped and riveted in the same manner as a boiler is built and having the appearance of a clinker built vessel. I got the following particulars respecting the ship from her commander Captain Thompson.

Keel 95 feet 2 inches

Beam outside 25 feet 5 inches

Beam inside 24 feet 4 inches

Depth of hold 14 feet 7 inches

Draft with 62 tons of ballast 6 feet

It is expected to carry 22 keels of coals at 12 feet draft of water. The keel is made of rolled iron plate 13/16 of an inch thick bent with a flange on each side. The plates ³/₄ of an inch thick up to the first futtocks – 5/8 up to the wales – the wales ³/₄ two tier of plates – one tier 5/8 inch and one tier ¹/₂ inch, 315 tons new and 298 tons old measurement. Is a very handsome vessel brig rigged, is very flat midships but two clean ends. The Captain says with 62 tons of ballast she sailed remarkably well in coming up from Aberdeen, and was very weatherly. She belongs to Andrew White and Co. A quadrant is fixed to the top of the rudder instead of a tiller to steer with – the curved part of the quadrant is towards the stern and is worked from the wheel. (Buddle, PB)

Buddle and Coutt's met regularly after Coutts moved to Tyneside in 1842 and set up a yard at Walker near Wallsend, the predecessor of the Swan Hunter Shipyard that built the great liner Mauretania and many other famous ships. Coutts made the first iron steamship built on the Tyne and Buddle followed its progress with interest.

> <u>Friday 22nd July 1842.</u> Visited Mr Coutts' iron ship building at Walker: He is building a steam passenger boat for London and a clipper schooner of 200 tons for the Mediterranean trade, the work is beautifully executed. (Buddle, PB)

> <u>Sunday 4th September 1842.</u> Visited Mr Coutts in the evening and inspected the boiler which he has built for the mining association to be sent out to Sydney and Picton. I also

examined the quick iron steamer which he is building for London River and the Iron Clipper Schooner for the Mediterranean trade – the latter 200 tons burthen. They are both beautiful vessels of their kind. (Buddle, PB)

<u>Sunday 5th March 1843.</u> At home: Mr and Mrs Coutts dined with us. I went to Coutts' building yard at Walker to see the iron built Clipper Schooner "Flash" which is now rigged and nearly fit for sea. This vessel is 200 tons new measurement and nothing can exceed the beauty and elegance of its appearance – it is more like a pleasure yacht than a merchant vessel. (Buddle, PB)

Probably the most unusual and unexpected item in Buddle's papers is the detailed specification of a liner designed by Coutts. The vessel was undoubtedly inspired by the East India Companies iron steamship Nemesis built at Liverpool by John Laird in 1839 which served to devastating effect in the Opium Wars. Coutts' design was for a liner which would carry passengers and mail from Suez down the Red Sea and across the Indian Ocean to Bombay. Before the 1830's the journey from Britain to India by sail via Cape Town took six months. In 1835 the East India Company pioneered the Red Sea route which reduced the journey time to between two and three months. Passengers and mail travelled from Britain to Alexandria then overland to Suez and on to India by steamship. The route down the Red Sea was only possible by steam and ships spent almost as long coaling at Aden as they did at sea. Coutts' liner was designed to complete the trip in one stage without stopping for coaling and travelling at 10 knots it could have reached Bombay in just 12 days and cut at least a month off the passage.

The specification which was intended for the British Government was probably given by Coutts to Buddle for his comments. The 840 ton vessel would have been 215 feet long by 28 feet wide inside the paddles; it had two 130 hp tower or steeple engines, three twenty five foot long boilers with twelve furnaces and could carry enough coal for 8,000 miles. Coutts estimated the cost of the liner ready for sea with engines and sails, but without the passenger cabins at £20,980, a saving he said of more than £9000 on an equivalent wooden vessel. The cabins and saloon would have been fitted out to a high standard in France where work of the quality required was cheaper than in England. Coutts offered the design to the British and French Governments, but unfortunately it was never built and within a few years Coutts was bankrupt. Buddle's comments on the design are not recorded but probably he was more interested in colliers than liners. Perhaps the main problem with Coutts design, which was a development of known and proven technology, rather than new and innovatory like the "Great Britain" was that unlike Brunel's ships it was too small, it could carry only sixty one passengers, the first class admittedly in some luxury in ten staterooms with three water closets and the others in male and female dormitories. Nemesis was a warship and didn't need space for passengers and mail and Coutt's failed to scale up the design enough to make it economically viable, although if it had been built it would have been the fastest steamship in the world and with proven technology unlike Brunel's "Great Britain" it was very likely to have worked.

Coutts' paddle steamer which Buddle saw in the yard in 1842 was the 100 hp 202 ton river steamer "Prince Albert" which was launched on the 23rd September 1842. The "Prince Albert" was the first iron steamship built on the Tyne, the forerunner of many, but at the time Coutts was working with Buddle on the design of another new ship which would have become the first steam collier. John Buddle died in October 1843 and never saw the ship, the 271 ton, 30 hp, propeller driven QED launched in September 1844. QED unlike the liner was modest, economic, and revolutionary, it had a double bottom for water ballast perfect for Seaham Harbour, and it was Buddle's ship.

<u>Sudden Death</u>

John Buddle died on the 10th October 1843 aged 70. He remained active up to the end of his life with no sign of physical or mental decline. The last entry in his diary dated 5th October 1843 is routine: "Spent the morning at Pensher and then met the river commission at Mr Clayton's office on the affair of lengthening rolly end gears carrying out the spents to the new quay line..." (Buddle, PB)

They agreed to meet at the staithes on an early date to investigate the matter and there the diary ends. Buddle was taken ill on the 7th October while out riding with Lord Londonderry and died at Wallsend a few days later.

He wrote his will literally on his death bed and died a very wealthy man disappointed that he did not live to see his plans for the development of steam colliers with John Coutts come to fruition. Even after all he had been through at Heaton, Jarrow, and Wallsend he remained optimistic about the future.

John Buddle's Will

This is the last will and testament of me, John Buddle, of Wallsend in the county of Northumberland Esquire made this ninth day of October one thousand eight hundred and forty three. I appoint Armorer Donkin and William George Armstrong of Jesmond in the county of Northumberland Esquires and my nephew Robert Thomas Atkinson Executors. In trust of this my will I give to my sister Mary Burnett during her life my dwelling house out offices and garden at Wallsend aforesaid and I give to her absolutely all my household furniture linen and other household effects not hereinafter specifically bequeathed. I give my freehold estate at Benwell in the county of Northumberland my tannery at Chester-Le-Street in the county of Durham my leasehold property at Wallsend aforesaid (subject as to my dwelling house out offices and garden there to the bequest thereof hereinbefore contained in favour of my said sister Mary Burnett) all my estate shares and interest in any collieries and coalmines seam or seams of coal of which I may die possessed or interested in whether as lessor or lessee and of and in all stock in trade and other effects of or belonging to any collieries or coalmines which I may be carrying on alone or in partnership with any other person or persons at the time of my decease all my professional places papers books and instruments and my library and all my plate and plated articles of every description unto my nephew Robert Thomas Atkinson. I give my estate at Hooker Gate in the county of Durham all my ships and shares of ships and all my shares in the Newcastle and Carlisle Railway and in the Great North of England Railway to Thomas Burnett of Newcastle upon Tyne nail manufacturer. I give all my musical instruments and music of every description

to the said Robert Thomas Atkinson and Thomas Burnett equally to be divided between them. I give all my shares in the Northumberland and Durham District Banking Company to my grand nephews and grandnieces the sons and daughters of the said Robert Thomas Atkinson, Thomas Burnett and of my nephews Smart Atkinson and John Atkinson and of my nieces Mary Ann Humber, Ellen Newton, Ann Elizabeth Burnett, Elizabeth Fothergill and Mary Bowman equally to be divided between them. I give the following pecuniary legacies to my nieces Mary Ann Humber, Ellen Newton, Ann Elizabeth Burnett, Elizabeth Fothergill and Mary Bowman and to my nephews Smart Atkinson and John Atkinson the sum of one thousand pounds apiece. I give to Sarah Westmoreland and Margaret Westmorland during their joint natural lives and to the survivor during her life my house in Lisle Street Newcastle upon Tyne and on the death of such survivor I give the same to the said Thomas Burnett. I give the following annuities, to the said Sarah Westmoreland and Margaret Westmoreland during their joint natural lives and to the survivor during her life an annuity of forty pounds. To my friend Mrs Margaret Wilson (daughter of my late friend Matthew Smith deceased) of in the said county of Durham widow an annuity of one hundred pounds during her life. To my friends Elizabeth Fryer, Barbara Fryer, Mary Fryer and Margaret Fryer all of Ryton

in the county of Durham an annuity of twenty pounds apiece during their respective lives and on the death of any or either of them I give the annuity of her then so dying to the survivors or survivor of them during her or their natural lives or life and if more than one in equal shares. To Jane Pollard of Newcastle upon Tyne aforesaid and spinster daughter of Joseph Pollard late of the same place corn merchant deceased an annuity of fifty pounds during her life. To my old and faithful servant John Charlton an annuity of thirty pounds during his life and to my servant Richard Armstrong an annuity of ten pounds during his life and as to all the rest and residue of my estate and effects as well real as personal I give and bequeath the same to the said Robert Thomas Atkinson and Thomas Burnett equally to be divided between them and I direct sufficient funds to be appropriated in the names of my Trustees and Executors for the time being out of my personal estate and invested on government or real security to assure by means of the income there from payment of the several annuities hereinbefore bequeathed which funds on the dropping of the said annuities shall follow the destination of the residue of my personal estate and I declare that all legacies and annuities given to females shall be for their respective and separate and peculiar use and benefit and shall not be subject to the control debts or

engagements of any husband or husbands to whom they are or may be married. I declare that my said Trustees and Executors shall be responsible only for their or his own respective acts defaults and receipts and be exempt from liability for involuntary losses and be at liberty to deduct and allow to each other all expenses incident to the execution of the trusts of my will. For witness whereof I have to this my will set my hand the day and year first hereinbefore written.

Mr Buddle. The signature at the foot or and of the foregoing writing was made by John Buddle of Wallsend in the county of Northumberland Esquire in the presence of us present at the same time and we in his presence and in the presence of each other have attested and do subscribe the same as his last will the several having been first made.

Buddle's stipulation that legacies and annuities to females were for their separate and peculiar use and not subject to their husbands reflects perhaps his experience with Lord Londonderry and his admiration for Frances Anne Vane-Tempest whose own marriage settlement certainly upheld that principal.

Endnotes

Interested readers can view all of John Buddle's Journals and Diaries at the Nicholas Wood Memorial Library of the North of England Institute of Mining and Mechanical Engineers, Newcastle upon Tyne. The catalogue reference of each volume is given in the Bibliography and readers will be able to follow in detail all of the events and themes I have included in this book. The diaries are a fantastic resource for local historians, students, and teachers, and I hope this book will encourage more people to visit the Library either to conduct their own research or just to enjoy reading about john buddle and his times.

I hope some readers will also want to visit St James Church at Benwell to visit the grave of John Buddle and his sister Ann. The churchyard is maintained by the St James' Church Heritage Group and the church is usually open to visitors on Tuesday afternoons.

Appendix: A Glossary of Mining Terms

<u>Atmospheric Engine</u>, a steam engine where the power stroke is produced by condensing steam in a cylinder and creating a partial vacuum so that the pressure of the atmosphere (32 pounds a square inch) pushes a piston down <u>Air Boxes</u>, rectangular pipes to bring fresh air into a mine or carry foulness out

<u>Air Course</u>, the planned route of air through a mine

<u>After Damp</u>, another name for carbon monoxide, a poisonous gas which forms after explosions and fires in mines

<u>Bag of Foulness</u>, gas which escapes from a pocket or hole in a seam often under pressure like from a bottle

<u>Barrier</u>, a thick band of coal left to separate the workings of one colliery from another, or within a colliery to separate one district from another

<u>Blower</u>, a sustained jet of inflammable air (methane) which escapes from a crack in the coal or rock under some pressure

<u>Board</u>, tunnels in a grid pattern which are driven to extract coal from a seam leaving substantial pillars to support the roof

<u>Brattice</u>, a wooden or canvas partition which divides a shaft or tunnel into two or more parts for the purpose of ventilation

<u>Chaldron</u>, an old measurement of the weight of coal equal in Newcastle to 53 hundredweight, about one waggon load

<u>Choke Damp</u>, air with insufficient oxygen to support life, typically a mixture of gases including carbon dioxide and water vapour which accumulated in badly ventilated spaces, also known as stythe or styth

<u>Cleading</u>, cladding, lining

<u>Corf</u>, a large basket used for transporting coal, men and materials also rode up and down the shaft in corfs in the first half of the Nineteenth Century <u>Creep</u>, the sinking of the pillars that support the roof in a mine into the floor caused by the pressure of the rock above

<u>Dam</u>, a wall sealing off one part of a mine and stopping the spread of water or gas into other areas

<u>Dead</u>, unventilated, cut off from the flow of air, liable to accumulate gas <u>Deputy</u>, miner who puts in props, brattices, stoppings, rollyways, and is responsible to the overman for safety and production in a mine

<u>District</u>, a distinct area of a coal seam separated from the rest by barriers from which coal may be taken and creep induced without affecting other parts of the colliery

<u>Downcast Shaft</u>, the shaft or part of a shaft that draws fresh air into a mine <u>Drift</u>, an exploratory tunnel which opens up a new area for mining <u>Dyke</u>, an interruption to a bed of coal usually a fault or intrusion of igneous rock

Engine Pit, the shaft with the pumping engine in a mine with more than one shaft

<u>Feeder</u>, spring of water into the workings of a colliery

Fire Engine, an old name for a steam engine

<u>Fire Damp</u>, the pitman's name for Methane, an inflammable and explosive gas found in coal seams

<u>Foulness</u>, a general term for an accumulation of various dangerous gases <u>Furnace</u>, a fire at the bottom of the upcast shaft which created a draught up the shaft to draw air down the downcast shaft and through the workings Gin, a horse powered windlass used to lift objects up a shaft

<u>Glebe</u>, church land

<u>Goaf</u>, the area left when coal after coal has been taken

Hewer, a pitman who cuts the coal at the face

Inflammable air, another name for Methane

Landsale coal, coal sold locally, usually of inferior quality

Onsetter, a miner who loads and unloads corfs at the bottom of the shaft

<u>Mothergate</u>, the main roadway of a pit

Overman, the foreman in charge of an area or shift

<u>Pillar</u>, a solid block of coal left to support the roof

<u>Plateway</u>, a waggonway where the L shaped track was made of metal

Putters, miners who take coal from the hewers to the rollies or to the Onsetter

Rollies, small wagons which could carry two or more corfs which ran on

plateways or railways and were used to transport coal from the face to the shaft

<u>Rolly Drivers</u>, boys who drove the ponies that pulled waggons on the railways or tramways in a mine

<u>Rollyway</u>, a narrow gauge railway or tramway in a mine

<u>Seam</u>, layer of coal in rock, can be a few inches to many feet thick

<u>Seasale Co</u>al, coal taken by ship to London to be sold

<u>Self-Acting Incline</u>, a railway down a hill where the weight of loaded waggons going down pulls the empty waggons up using a rope round a drum at the top of the incline

<u>Shifters</u>, maintenance men responsible for moving equipment and materials in a mine

<u>Shots</u>, charges of gunpowder used to break up coal at the face and make it easier to work

<u>Staple</u>, a shaft linking two different levels in mine which does not go all the way to the surface

<u>Steel Mill</u>, a small grinding wheel which produced a shower of sparks which were supposed to give a safe light

<u>Stoppings</u>, barriers of wood or canvas used to block tunnels and control the route of air through a mine

<u>Stowing</u>, packing the boards of a pit with stone to support the roof

<u>Threads</u>, thin cracks in coal or rock that gas could escape from

Thrill, the stone at the top of a seam or tunnel

<u>Tramway</u>, another name for a narrow gauge railway, usually two feet

<u>Trapper</u>, a young boy who kept a door which controlled the flow of air round

a pit, opening and closing it to let men and rollies pass

<u>Trevithick Engine</u>, steam engine which used steam at greater than atmospheric pressure to produce power by forcing a piston up a cylinder <u>Vend</u>, the amount of coal a colliery was allowed to sell on the London market under the regulation, sometimes called ship coal

<u>Underviewer</u>, the deputy viewer, permanently employed at a particular colliery while viewers usually visited a number of collieries as consultants <u>Upcast Shaft</u>, the shaft which draws air out of a mine usually by means of the draught from a furnace sending hot air up the shaft like a chimney

<u>Viewer</u>, originally the representative of the owner of a colliery who periodically inspects the workings and checks production later the person who managers the colliery on behalf of the owner

<u>Waggonway</u>, an early form of railway where trucks ran along wooden L shaped tracks with the wheel guided by the upright plank rather than a flange on the wheel.

Waste, a worked out areas of a pit

<u>Wasteman</u>, an experienced pitman who checked old workings for gas and maintained the air course

<u>Waterfall</u>, a way of ventilating a mine in the presence of gas by sending a stream of water down the shaft

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David Kidd was born in South Shields. He is a graduate of the University of Leicester in Economic History, and he worked as a teacher in the North East of England before moving to Africa on his retirement to work as a volunteer teacher in Eritrea and Ethiopia. He has lived in Africa for the last seven years now and took up writing as a hobby to remind him of home. He became interested in John Buddle when he was a volunteer at the Mining Institute in Newcastle and first read John Buddle's diaries. This is his first book.

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