The Knife Man

Wendy Moore

Chapter 1

The Coach Driver's Knee

'I have seen a man die almost immediately upon the loss of a testicle ...The loss of a limb above the knee, is more than man can bear...'
John Hunter

St George's Hospital, Hyde Park Corner, London, December 1785

The patient faced an agonizing choice. Above the cries and moans of fellow sufferers on the fetid ward, he listened as the surgeon outlined the dilemma. If the large swelling at the back of his knee was left to continue growing, it would eventually burst, leading to certain and painful death. If, on the other hand, the leg was amputated above the knee, there was a slim chance he would survive the crude operation - provided he did not die of shock on the operating table, or bleed to death soon after, or succumb to infection on the filthy ward days later - but he would be permanently disabled.

For the forty-five-year-old hackney coach driver either option was unthinkable. Since he had first noticed the swelling in the hollow behind his knee three years ago, the lump had grown steadily until it was now the size of an orange; it throbbed continuously and had become so painful he could barely walk. Extended on the hospital bed before him, the leg and foot were hideously swollen while the skin had turned an unsightly mottled brown. Once the coachman had gained admittance to St George's, having successfully persuaded the governors he was a deserving recipient of their charity, the surgeon on duty had lost no time in making a diagnosis. After examining the tell-tale lump, which was 'so large as to distend the two hamstrings laterally', he had no doubts about the verdict. The surgeon had seen popliteal aneurysms at exactly the same spot on numerous occasions and knew all too well the prognosis.

It was a common enough problem in the cab driver's line of work: popliteal aneurysms could happen to anyone - they could develop in arteries anywhere in the body either through injury or, more commonly, due to a medical condition as a result of which the artery walls lose their elasticity - but appeared to occur with unnatural frequency among coach drivers, postilions and others working in equestrian occupations in Georgian London. The problem may quite possibly have been exacerbated by the wearing of high leather riding boots which rubbed at the back of the knee. Whatever the cause, the weakened section of artery would begin to

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bulge and develop into a sac which eventually became filled with clotted blood. When these occurred behind the knee, in the popliteal artery, they were not only extremely painful but made walking exceedingly difficult. The outcome was often an early death, if not from the condition itself then from the treatment generally meted out. To lose his leg, even supposing the coach driver survived such a drastic procedure in an era long before anaesthesia or antiseptics, would inevitably mean never being able to work again. But to carry on working, navigating his horse-drawn carriage over London's rutted and congested roads, would be plainly impossible if the lump was left to grow. Either way, the cabbie faced destitution and the workhouse.

But there was a third choice, the surgeon at his bedside now confided on that early December day, for a coachman sufficiently willing or desperate. In his slow Scottish lilt, redolent of his humble Lowland farming origins, the surgeon laid out his scheme for a daring and novel operation. Surrounded by the poxed, maimed and diseased bodies of London's poorest, huddled in their beds on the draughty ward, the cabbie resolved to put his life in the hands of John Hunter.

Without a doubt, John Hunter's reputation would have been well known to the coach driver long before he limped through the portal of St George's, for he was generally acknowledged as one of the best-skilled surgeons in London, if not Europe, and was a favourite among the well-heeled and the unshod alike. As well as working for no recompense in St George's, patching up the poor most afternoons, he was in constant demand from the fee-paying patients who thronged each morning to his fashionable home in Leicester Square or called him out for consultations in the elegant drawing rooms of their West End mansions. For all his blunt manners, his coarse speech and his disdain for fashion - he currently sported an unkempt beard and tied his tawny-coloured hair back in preference to the customary wig - Hunter was firmly established in Georgian high society, visiting court as Surgeon Extraordinary to George III, dining with the society artist Sir Joshua Reynolds, and debating science with his close friend, the well-connected naturalist Sir Joseph Banks.

Now aged fifty-seven, with seventeen years' service on the staff of St George's under his belt, Hunter was approaching the peak of his career and success, and enjoyed fame and earning power in equal measures as reward. When the Scottish philosopher David Hume consulted a galaxy of doctors about his worsening health in 1776, it was Hunter - the only one of the medics physically to examine the patient - who diagnosed terminal cancer. It was Hunter who gave first-aid to Dr Nevil Maskelyne, the ambitious astronomer royal, when he collapsed vomiting in a coffee-house after eating tripe in 1782. And when the genial American diplomat Benjamin Franklin became crippled with pain from a bladder stone in the summer of 1785, it was Hunter he consulted.

Aside from tackling the routine surgeons' fare of stanching stab-wounds from duels, removing lumps and limbs, and tending sundry abscesses, boils, pimples and running sores, Hunter was renowned for his pioneering operations. Only two months before the coach driver's admission he had skilfully cut away from the neck of a thirty-seven-year-old man a massive benign tumour that weighed more than

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four kilograms and measured roughly the size of an extra head. The grateful patient had walked away with only a long, neat scar as a souvenir of his ordeal.

No doubt the coachman had also watched from his bed as Hunter's medical students trooped devotedly after their teacher on his regular rounds of the surgical wards, for more pupils flocked to Hunter's side than to all the other surgeons at St George's put together. Aspiring young surgeons travelled not only from the far reaches of the British Isles but even from across the Atlantic to 'walk the wards' at Hunter's side and to hear their hero expound his radical views in the private lectures he held at his home throughout the winter. Fired by his revolutionary ideas, they walked home to their lodgings through the dimly lit streets hotly debating the theories they had absorbed, and would quote their mentor, as one put it, with all the authority of Aristotle. One zealous student reported Hunter's lectures as 'so far superior to every thing I had conceived or heard before, that there seemed no comparison between the mind of the man who delivered them, and all the individuals whether ancient or modern who had ever gone before him'. Another devotee called him simply 'the dear man'.

But the cabbie would doubtless also have heard darker stories, whispered on the wards, insinuated in newspapers or muttered in taverns, coffee-houses and cockpits, for Hunter was not a popular man within the four walls of St George's. Although his pupils idolized their master, and patients were frequently thankful to the bluff but honest surgeon, Hunter's fiery temper and maverick views, coupled with his decidedly unorthodox methods, had earned him powerful enemies at the hospital and beyond. While aristocrats humbly bowed to his medical advice and denizens of the Royal Society - the engine room of eighteenth-century progress - hung on his every pronouncement, Hunter was isolated at St George's. To his fellow surgeons he was at best a laughing stock and at worst a reckless, ill-educated fool. Hunter had quarrelled too with several of the city's other leading practitioners, not least his own brother.

To the students, the explanation was straightforward: Hunter was simply so far ahead of his contemporaries that he stood alone. 'It was a comfortless precedence, for it deprived him of sympathy and social co-operation; and he felt that his labours and merits were not known, or fairly estimated,' said one. But rival surgeons had other views. Colleagues at St George's decried Hunter's novel approach and his controversial methods, preferring rather to bleed, blister and purge their patients to early graves, in strict accordance with classical teaching stretching back to Ancient Greece, than to question any established modes of practice. They certainly concurred with, if not actively encouraged, Hunter's most vociferous enemy, a mediocre house surgeon at the nearby Middlesex Hospital called Jessé Foot, whom Hunter had once stung by summarily dismissing a surgical appliance the young man had invented. In Foot's view, Hunter was 'a very inferior, dangerous, and irregular practical surgeon' who was, furthermore, embroiled in 'continual war' at St George's.

Aside from concerns at his unusual ways, the chief source of conflict at the hospital was Hunter's enduring campaign to create a medical school aimed at providing students with a rounded introduction to surgery along the lines of the model established earlier in 1785 at the London Hospital. But this idea had been

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peremptorily rejected by Hunter's contemporaries. Thwarted by his efforts to enhance medical education, Hunter had been staging lectures on surgery in his own home for more than a decade, and had even invited St George's pupils to his early courses for free.

But there were stranger stories still about the rebellious surgeon, which could hardly have escaped the coach driver's attention. Hunter, for instance, was well known to keep rare and exotic wild beasts - including a lion, a jackal, a dingo and two leopards - at his country home in the tranquil village of Earls Court, a few miles to the west of London. It was in this rural retreat that the surgeon performed countless experiments on animals both dead and alive. Innumerable research papers, presented to his friends in the Royal Society, detailed the bizarre experiments he had pioneered, such as grafting a cockerel's testicle into the belly of a hen - an early step towards transplanting body parts in humans - as well as the freezing of fish and rabbits' ears in a forlorn attempt to invent a scheme for human immortality. At this prototype research centre, Hunter dissected great carcasses, including whales washed up on the banks of the Thames, apes sent back from explorations into unmapped territories, and elephants donated by Queen Charlotte. Yet he was just as fascinated to study the tiniest of living forms, like the worms he discovered inside the whales' intestines and the bees he tended in observation hives in the conservatory. It was here too that he experimented on living animals, tying down squealing pigs, sheep and dogs for lengthy dissections designed to explore how healthy organs function and to test theories on ways to improve surgery for his numerous patients. Curious neighbours, by now inured to the sight of rare animals grazing his lawns, had nicknamed Hunter 'the cunning man', reputedly in reference to his reputation for knowledge rather than to anything more sinister. Yet the villagers must still have gaped on occasions when the surgeon himself drove a cart pulled by three Asian buffaloes from Earls Court through the crowded West End streets to his Leicester Square townhouse, where a drawbridge could be swiftly lowered - and just as swiftly raised - to allow mysterious cargoes to trundle in and out.

Naturally enough, the enterprising surgeon did not confine his zeal for research to the animal kingdom. Hunter had built up his surgical expertise through an unrivalled knowledge of human anatomy. Ever since arriving in London almost four decades earlier, Hunter had dissected human bodies in unprecedented numbers. Giving evidence as an expert witness at a recent murder trial, he had been asked, 'I presume you have dissected more than any man in Europe?' and agreed, 'I have dissected some thousands during these thirty-three years.' It was through this relentless first-hand exploration of the human body, rather than by reading the dry works of the Ancient Greeks and Romans or passively watching over the shoulders of other medical men, that Hunter had become such a skilled operator. Although other surgeons of the day had become adept at certain procedures through the long experience of trial and error, many operations performed in London's charity hospitals were still risky gambles through comparative ignorance of anatomy and physiology. Whenever Hunter, by contrast, lifted his knife to begin an operation he knew precisely what lay beneath; he possessed a better knowledge of the human interior than any other surgeon in town. When Hunter cut, probed, sliced and sawed, he knew better than anyone else the exact whereabouts, the precise functions

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and the particular habits of every organ, muscle, blood vessel and tissue, healthy or diseased, that he was likely to encounter.

Yet while many of Hunter's patients, rich and poor, had good reason to give thanks for the surgeon's intimate knowledge of the human body, precious few would have given their approval to the sinister extremes to which he went to obtain his research material. Like all surgeons and anatomists of the time, Hunter had no lawful source for the majority of the bodies he daily dissected and he, like others, was forced to turn to underhand means to pursue his work. Although more enlightened families might give their consent to an autopsy on a relative who died on the operating table in order to discover the cause of death, most of the London populace still recoiled with horror at the notion of cutting up the body of a loved one. In consequence, surgeons had little option but to find alternative sources for the bodies they needed to hone their skills.

The gallows provided one steady stream of corpses for keen anatomists, both within the law - the Company of Surgeons in London was legally entitled to the bodies of six hanged murderers each year for public dissection - and outside the law, as surgeons flocked to Tyburn Tree on hanging days to beg, buy or steal the corpses of executed villains. But since even the steady flow of petty felons condemned to the gallows could not keep pace with the growing demands of anatomists, other more devious methods had evolved. Like other London anatomists, Hunter had turned to unscrupulous undertakers, shifty gravediggers and, above all, the gangs of professional body-snatchers who scoured London's churchyards by night unearthing fresh bodies to deliver to dissecting rooms before dawn. Hunter, however, had gone further than any other anatomist of his day in his connections with the Georgian underworld.

Since embarking on anatomy as an enthusiastic youth, Hunter had fostered the closest and friendliest of relations with the so-called Resurrectionists; he was renowned for offering the highest prices to ensure a regular supply of dissection material for himself and his students. In particular, he was notorious for paying above the odds for any kind of anatomical curiosity, whether rare human deformities or the results of a pioneering but ultimately fatal operation. Indeed, even as the coach driver pondered his dilemma, rumours were still circulating over the fate of the body of the towering Charles Byrne, better known as the 'Irish giant', who had begged on his deathbed in 1783 to be buried in a lead coffin at sea in an effort to keep out of John Hunter's clutches. Whether or not Byrne's skeleton would finally be unveiled in Hunter's remarkable museum, newly established in his Leicester Square house, alongside the dried limbs and pickled organs of unfortunate patients, the varnished bones of tropical beasts and the shrivelled bodies of unborn babies was still the subject of speculation.

So as the tortured coach driver stared anxiously from his hospital bed into Hunter's pale blue eyes, he would have been well aware that volunteering to go under the renowned surgeon's knife once, in the operating theatre at St George's, could very well mean going under his knife a second time - dead on the dissection table with his mutilated leg destined for the anatomist's museum. Nonetheless, clinging to the slim

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prospect of recovery now held out to him, he gave John Hunter his consent for the new operation.

For Hunter, the coach driver represented the perfect human guinea-pig for his experimental approach to surgery. Until now, he had attempted to save patients with popliteal aneurysms from either a premature death or a life-threatening amputation by performing an operation which was both highly risky and exceedingly painful. This procedure, which had been attempted by surgeons both in Britain and on the Continent with various refinements for several centuries, meant cutting directly into the back of the knee, tying the damaged artery above and below the aneurysm, and scraping out the blood-filled sac. Based on his knowledge of anatomy and experiments performed in his Earls Court laboratory, Hunter hoped that once the blood was prevented from taking its usual route down the tied popliteal artery, the main blood vessel at the back of the leg, it would find alternative routes - or 'collateral circulation' - through the smaller blood vessels in the area. Almost without exception, the technique had failed; more often than not the already weakened blood vessel burst, haemorrhaging ensued and the patient died, making Hunter even more the butt of his colleagues' scorn.

Percivall Pott, a respected surgeon at St Bartholomew's Hospital and once Hunter's own teacher, insisted that amputation was the only viable remedy for popliteal aneurysms, even though he admitted the procedure was 'terrible to bear, horrid to see, and must leave the person on whom it has been performed in a mutilated imperfect state', and despite the fact that so many patients expired on the table. Denouncing Hunter's method, he argued that the surrounding blood vessels in the leg were simply too few and too small to foster collateral circulation once the main artery was tied. Conversely, William Bromfield, the recently retired senior surgeon at St George's who had once been Hunter's examiner for his surgeon's diploma, argued that neither amputation nor 'Hunter's operation' were the slightest use in treating the condition. Mistakenly averring that a popliteal aneurysm indicated that a patient's entire arterial system was diseased, he claimed that there was simply no cure for the problem. It was an opinion that effectively dealt a death sentence to every poor coachman who ventured into his care.

Never one to bow to authority or defer to his elders, Hunter was not prepared to give up hope and consign his patients to a lingering, agonizing death, while his aversion to drastic surgery except as a last resort and his firm belief in nature's healing powers made him equally unwilling to perform amputations. Refusing to be defeated, he resolved to apply his unique and controversial approach to the problem. Unlike the vast majority of surgeons operating in London homes and hospitals, who wielded their lancets and saws in imitation of long-dead past masters of the art and rarely considered any need for improvement, Hunter believed that surgery should be governed by scientific principles, based on sound reasoning, observation and experimentation. Much of this iconoclastic philosophy he owed to his unconventional training.

In general, eighteenth-century surgeons learned their practice through a system of apprenticeship, no different to that for barbers, carpenters or tailors, in which they slavishly followed in the footsteps of a senior surgeon and copied more or less

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exactly his methods of performing operations - with often lethal results - while rarely, if ever, questioning them. Techniques for most operations had changed little since medieval times, while treatment regimes still owed their theory largely to the Ancient Greeks. Although medical students usually learned some rudimentary anatomy, in private lessons, this was considered a useful but not vital adjunct to on-the-job experience. And when patients therefore died painful deaths on the operating table through ignorance and blundering, as they frequently did, few if any lessons were learned from the outcome.

Hunter, by contrast, had enjoyed a distinctly different preparation for the job, having spent a full twelve years studying anatomy in his brother's dissecting rooms and only a few short spells 'walking the wards', followed by a brief period as an army surgeon. As a consequence, he considered anatomy the foundation stone for all surgery. Only by minutely studying the human body, in order to understand the whereabouts and connections of every living part, did he believe that surgeons could possibly hope to improve their skills. Furthermore, his experience on the hospital wards had taught him principally, in ghastly and bloody detail, how primitive his profession really was. Inquisitive by nature, Hunter was never content simply to mimic in passive silence the lethal methods of others. Investigation and experimentation were the only way forward, in his view, if surgery was ever to make progress.

A few enlightened surgeons, such as Pott at St Bartholomew's, also saw the necessity of dragging surgery out of its medieval shackles and into a scientific age, but only Hunter systematically set out to question every established practice, develop hypotheses to advance better methods, and demonstrate whether these worked through rigorous observation, investigation and experiment. More often than not, Hunter tested out his theories on animals before attempting new procedures on humans, while the results of the handiwork he performed in the operating theatre were always carefully observed during the patient's subsequent recovery, or, if they died, in post-mortem investigations. Lessons thus learned were diligently applied to modify his methods in a continuous research loop which would still stand up to scientific scrutiny more than two centuries later. Instilling the same approach in his loyal pupils Hunter summed up his doctrine in characteristically concise style when his favourite protégé, Edward Jenner, asked him for help in solving a problem. 'I think your solution is just,' responded his mentor, 'but why think, why not trie the Expt.'

So, while Pott persisted in amputating limbs swollen by aneurysms, in the absence of any alternative, and Bromfield simply wrote off patients with aneurysms who arrived at hospital during his rota, Hunter set out to apply scientific method to the problem. Indeed, he had been studying aneurysms in the numerous bodies that ended up on his dissecting-room slab for at least twenty years. His few surviving case books record the dissection of a chairman - someone hired to carry a sedan chair - who died from an aneurysm in his thigh as far back as the winter of 1764-5. Although the chairman was among Hunter's earliest patients, he even then believed that had the man's artery been tied, the blood circulation would have found alternative routes and his leg, and life, would have been saved. 'Here was a Case where something might have been done to save a patient's life', he lamented, but,

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wary of risking his early reputation, he added dolefully, 'it would have been trying experiments that the Cautious Ignorant are not fond of'.

Nevertheless, Hunter refused to let the problem alone, all too aware that 'This disease, if not attended to, is as dangerous as any that can affect the human body, because it is such as must always, even in the smallest arteries, kill.' Convinced that aneurysms could be cured, he expounded his views to rapt students at his private lectures in typically robust manner. First, describing Bromfield's objections while mischievously aping the elder surgeon's pompous style, Hunter recounted, 'he says, "I once saw this operation performed by a gentleman (that's me, gentlemen) upon a popliteal artery; but the difficulty of the operation and the embarrassment which the operator underwent (me again), will, I dare say, deter him from performing it again"'. But Hunter was 'not so soon deterred', he assured his pupils, declaring, 'Unfortunately, either for Mr Bromfield or myself, this is the very case from which I have formed favourable ideas of the success of further operations of a similar nature.'

Despite the fact that his usual method of operating on popliteal aneurysms by tying the artery at the point of the damage - behind the knee - had so far failed, he remained convinced that the basic theory of collateral circulation held good. An understanding of collateral circulation had been grasped even by the Romans, who tied small blood vessels when damaged and relied on alternative routes for the blood supply, as far back as the first century AD. Yet Hunter's peers refused to believe that collateral circulation could provide an adequate blood supply to nourish an entire leg once the main artery was severed, or that it could develop sufficiently quickly before gangrene set in. Knowing his attempts to tie the artery behind the knee had failed, he now asked his students, 'Why not tie it up higher in the sound parts, where it is tied in amputation, and preserve the limb?' Tying the artery in the patient's thigh, where the blood vessel was healthy, might have more chance of holding firm, he theorized, while allowing the blood flow to create bypass routes around the diseased area lower down. And he summarily dismissed Bromfield's objections to such a scheme with the words, 'With respect to the objection from the disease being of the whole arterial system, unfortunately for Mr Bromfield, and fortunately for me and for mankind, this is not always the case.'

According to his usual scientific doctrine, Hunter first conducted experiments on animals to test out his hypothesis, choosing dogs as his substitute patients. In one such trial he instructed an assistant, his young brother-in-law Everard Home, to cut open the leg of a live dog and expose the artery. Under Hunter's directions, Home carefully peeled away layer after layer of artery walls until the vessel was so thin that the blood could be seen as it pumped through. Home sewed up the dog's leg and after six weeks killed the animal, to discover that the artery had fully recovered its normal thickness. The results clearly suggested that the thinness of the artery walls did not account for the failure of the operations, confirming Hunter's belief that the section of artery close to the aneurysm must be otherwise damaged or diseased. He was now more certain than ever that tying the popliteal artery behind the knee, close to the aneurysm, was clinically doomed; the only chance of success was to tie the artery higher up in the leg, where it is called the femoral artery.

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Hunter even tested his theory on a stag from the royal herd in Richmond Park with permission from George III, according to oral traditions handed down from one of Hunter's assistants to another. Having caught the stag, Hunter cut into its neck and tied the carotid artery, which supplies blood to the antlers. Soon enough the half-grown antlers grew cold to the touch, as he expected. But a week or so later, upon checking the stag, he discovered that the antlers had not only regained their warmth but continued to grow. Ordering the deer to be slaughtered and sent to his dissecting room at Leicester Square, he opened the beast and injected its blood vessels with a coloured resin. Now he discovered that the stag's blood supply had found a new route through smaller blood vessels, bypassing the tied artery. The experiment provided further proof to support his belief in collateral circulation. It was now abundantly clear that blood could find alternative routes, and quickly too.

Yet despite his passion for experiment and experience in surgery, Hunter never approached an operation lightly. All too aware of the inadequacies of his own profession, as well as the dangers of infection and blood loss, he recommended extreme caution, advising his students against operating at all unless strictly necessary, with the admonition, 'No surgeon should approach the victim of his operation without a sacred dread and reluctance'. In one instance he even went so far as to deter a patient whom he believed had been erroneously diagnosed with cancer by another surgeon and who was about to undergo a needless castration by describing the procedure in all too graphic detail. Relating the story to his pupils, he said, 'the Instruments were all ready and the Patient also and how to settle matters so as to save the Credit of the Surgeon, I was at a loss to know. I could not possibly think of letting the Poor Man loose his Testicle & therefore took advantage of the fear he express'd on account of the operation, painting it in the most horrid light to him, when he enquired of me what was to be done. This had the desir'd effect; for he declar'd he would not have it perform'd at any rate.' After being despatched with a relatively harmless potion, the patient soon recovered.

Hunter was also firmly of the opinion that no surgeon should perform an operation he would not willingly have performed on himself under similar circumstances. 'I would have no one perform an operation that he is not clear about the propriety of himself, especially when it requires more anatomical skill than falls to the share of most practitioners,' he advised his pupils. And so, when outlining his plan for the new popliteal aneurysm operation, he declared, 'In this account, it may be supposed that I carry my notion too far; but it is to be understood that I only give my own feelings upon this subject, and I go no further in theory than I would perform in practice, if patients, being acquainted with the consequences of the disease, would submit to, or rather desire, the operation; nor do I go further than I now think I would have performed on myself were I in the same situation.' Having therefore acquainted the coach driver with the likely consequences of his condition, and having advanced his opinion as to the most amenable remedy, Hunter left his patient in little doubt that the new operation was his best hope.

Just days later, on 12 December, the coachman was helped into the operating theatre - situated rather inconveniently directly above the hospital's boardroom - to begin his ordeal. Although minor operations were still sometimes carried out in patients' beds on the wards - and some beds were equipped with straps and handcuffs for the

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purpose - Hunter would have desired an audience of students and fellow surgeons for his radical experiment. Covering his normal day clothes with an apron, probably stiff with the dried blood of past patients, he would have worn neither gloves nor mask. With no understanding of how infection transferred from surgeon's begrimed fingers to patient's open wounds - this was almost a century before Joseph Lister pioneered antiseptics - Hunter would have had no cause to wash his hands or sterilize his instruments. Quite likely they were encrusted with the blood, pus and tissue of previous operations. As his personal set of knives lay ready and junior surgeons craned their necks to see, Hunter would have checked that his patient still consented to the operation. Then, grabbed by muscular assistants, the cabbie would have been held tightly on the narrow wooden operating table, his leg firmly secured. If he was lucky, he would have been offered a stiff shot of brandy or some laudanum - a heady mixture of alcohol and opium - to dull the coming pain, although it would be many decades before the introduction of effective anaesthesia. Held, observed, conscious and petrified, the coach driver tensed for the first cut. Well aware the experimental operation was still very much a gamble, he would have known that Hunter's whiskered face might be the last he would ever see.

Among the spellbound observers gathered in the theatre to watch the spectacle was a young Italian surgeon, Paolo Assalini, who was on a tour of Europe to further his medical education. He later wrote an eyewitness account of the whole operation:

John Hunter, having placed the patient in a convenient position, made an incision about five inches long in the skin of the inner, lower part of the thigh with a small knife; he exposed the artery, then grasped it in his fingertips and separated it from the cellular membrane, the vein and the nerve for a distance of eight inches, making use only of the slender handle of his knife. This done, he passed under the artery a grooved probe, and ran along this a silver needle threaded with a thick ligature which he tied on the lower part of the artery to block it off. The pulsation in the tumour ceased immediately but the blood thumped with such force against the ligature that to diminish the knocking and the danger of the thing bursting he made another ligature two inches away from the first one and tied it less tightly. Above this second one he made a third, tied even more loosely, and then a fourth ... Then, after pulling the threads to the outside, and separating them, he closed the lips of the wound.

Hunter then bound the two sides of the wound together with sticking plaster and bandages, leaving the ends of the threads hanging out to be removed later. He had to work quickly to keep blood loss to a minimum and to reduce the risk of traumatic shock, so the whole process would have taken less than five minutes.

By the following day, the coachman's leg was already less swollen and the lump one-third smaller. By the fourth day, when the dressings were removed, the wound had sealed and the patient reported no pain. Although the wound bled a little some days later, after two weeks the silk threads fell away and the lump was significantly reduced. At the end of January 1786, six weeks after his operation, the coach driver walked out of St George's Hospital, and by July he was back in the driving seat of his hackney carriage, transporting passengers around London's chaotic streets. As word of the dramatic new operation spread, it was soon being copied in other London

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hospitals. Indeed, Hunter's operation rapidly became the standard procedure for aneurysms in various arteries, its details described extensively in the London Medical Journal of 1786. Almost as quickly, the technique was adopted in France and Italy. As the gleeful Assalini enthused, 'This operation, followed by such a happy outcome, excited the greatest wonder and awakened the attention of all the surgeons in Europe.'

As with so many pioneering medical advances, progress was not, however, completely unhindered. After almost a year back at work, exposed to all the elements, the poor coach driver caught a fever - completely unconnected with either his aneurysm or the operation - and on 1 April 1787 he died. 'He had not made any complaint of the limb on which the operation had been performed from the time of his leaving the hospital,' insisted Hunter's brother-in-law Everard Home when later describing the operation. Seven days after his patient had died, and 'with some trouble and considerable expense', Hunter managed to obtain the cabbie's leg. Eagerly, he brought the limb back to his attic dissecting room, anxious to see for himself the results of his great experiment. Once more he wielded his knife and cut into the coach driver's leg. The aneurysm behind the knee was easy enough to find, still 'larger than a hen's egg', but the femoral artery above it had formed new routes through smaller blood vessels to bypass the diseased area and rejoin the artery further down, just as Hunter had predicted. The leg was otherwise perfectly healthy; there could be no doubt that the operation had been a success. Hunter went on to repeat his operation on at least four occasions, and although one of these patients died soon after, his fourth patient, another coach driver, recovered completely - after recuperating in the countryside at Hunter's expense - and went on to live for another fifty years.

The operation first performed on the coach driver not only extended Hunter's reputation for daring and experimentation among Europe's surgeons while enhancing his prowess in the adoring eyes of his pupils, it would save countless lives, unroll a whole new era of operations and help to establish the foundations of scientific surgery. The procedure, which was a perfect example of the way Hunter applied scientific principles to every aspect of his work, would ensure his name lived on. The technique was henceforth called 'Hunter's operation', and the site of his knifework was ever after known as 'Hunter's canal'. This tribute alone might have been enough for any ambitious surgeon hoping to secure a place in the medical hall of fame, but it would never have satisfied the irrepressible John Hunter. He barely paused to acknowledge his advance, and never personally wrote about it, before plunging back into his daily round of ceaseless experiments. Hunter had far too many other medical interests, from artificial insemination to electrical stimulation of the heart, and far too broad a vision, spanning botany, geology, early biology and even the origins of life itself, ever to rest on his laurels.

Neither did the success of the remarkable operation do anything to stop the carping of his jealous colleagues at St George's, or the scorn flowing from Jessé Foot's barbed pen, both of which continued regardless. But it was not Hunter's style to build bridges or attempt to resolve conflicts amicably, for he had courted controversy from the moment he dismounted from his horse, a brash, ill-educated, rough-mannered

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country boy fresh down from Scotland, in the middle of London's vibrant Covent Garden in 1748.

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