
Opening Extract from...

Map of a Nation

A Biography of the Ordnance Survey

Written by Rachel Hewitt

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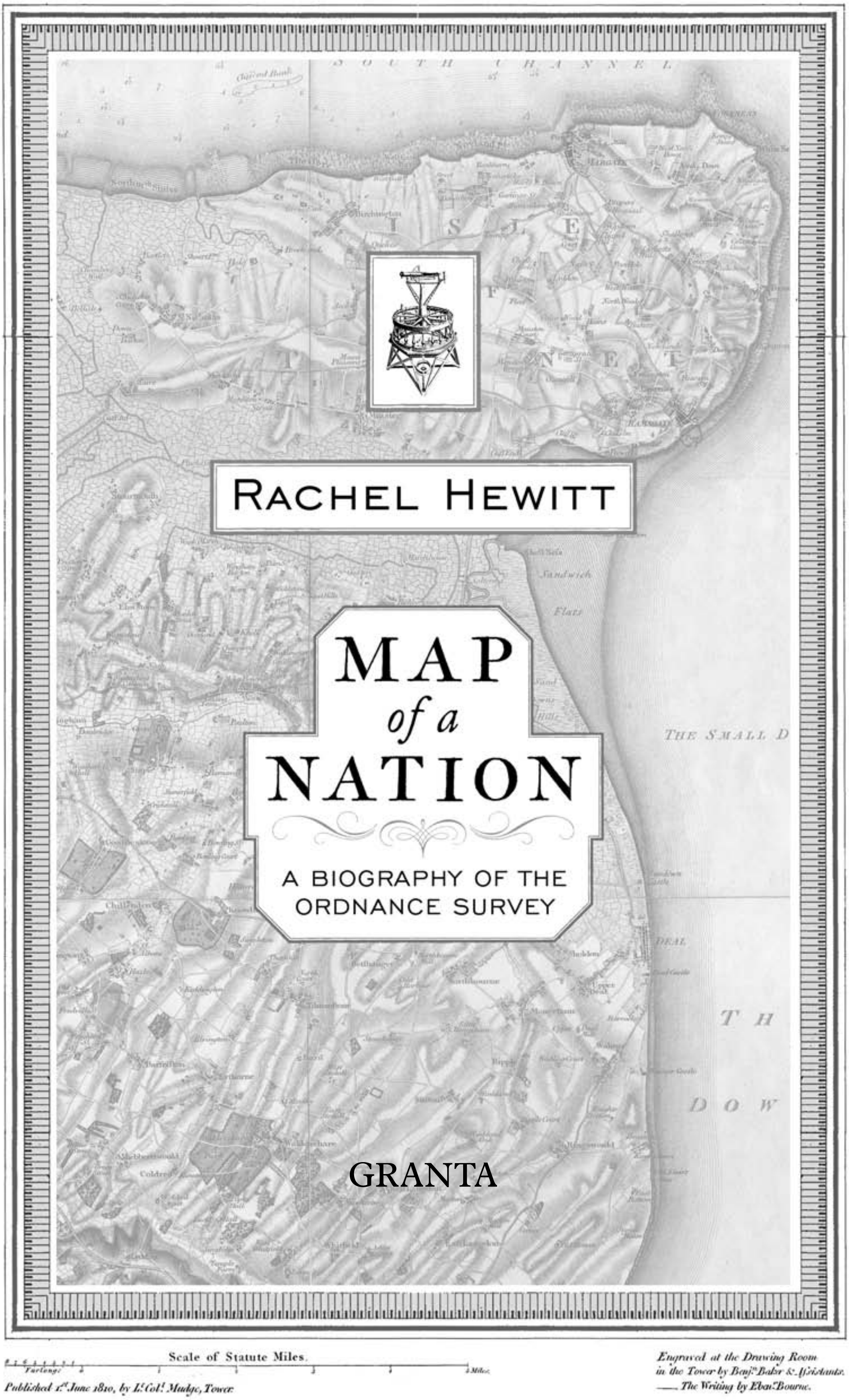

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PROLOGUE

Lost and Found

ON THE EVENING OF 16 April 1746 two men dined together in a castle on the south bank of the Beauly River, in Inverness-shire in Scotland. One was nearly eighty years old, stout but frail. His face was twisted by adversity and guile and dominated by an enormous yellowing periwig. Beneath it, heavily lidded eyes regarded his guest with concern. The second man was much younger, twenty-six years old. He had a naturally clear complexion, delicate lips and large eyes that were contorted with despair. In the months that followed, a tide of pamphlets, newspaper reports and biographies would speculate about the conversation that passed between the two men that evening. The younger, it was believed, had collapsed on the older, Simon Fraser, 11th Lord Lovat, in hysterical grief. 'My Lord,' he had cried, 'we are undone! My Army is routed! What will become of poor Scotland?' He was said to have fainted dead away on Lovat's bed.

Charles Edward Stuart had good reason for such misery. Since the so-called Glorious Revolution of 1688, which had seen the 'abdication' of his grandfather James II (VII of Scotland), there had been several armed rebellions aimed at reinstating the Stuart monarchy. Most Lowland Scots and the greater part of the English had not supported them: they had welcomed, or at least not strongly opposed, James II's departure. But the Scottish Highlands were different. The inhabitants of this often sublimely beautiful region were organised into clans to whose chiefs they looked for security and

authority. For both religious and political reasons, the clans were drawn much more strongly to the absolutist and often Catholic Stuart kings than to the Protestant monarchs who reigned over Britain after 1688. In 1715 and 1719, serious Jacobite (from *Jacobus*, the Latin for James) uprisings had broken out in the Highlands, with the aim of ousting the Hanoverian British king, George I, and restoring the Stuarts. The situation then largely quietened for a quarter of a century until, in early 1744, whispers of renewed unrest started to circulate. After an initial attempt at rebellion failed, in July 1745 James II's grandson Charles Edward Stuart, known as the 'Young Pretender', had travelled from exile in Italy to board a frigate at Saint Nazaire on France's west coast. After a voyage fraught with danger, he had landed a month later on Eriksay in the Western Isles of Scotland.

Over the ensuing months, the Young Pretender had gathered a Jacobite army of several thousand, largely consisting of Highlanders. He had pronounced James II 'King of Britain', gained control of Edinburgh, and won a devastating victory against George II's army at Prestonpans, a few miles east of Scotland's capital. Stuart had then led his troops down through Scotland into England, arriving as far south as Derby on 4 December 1745, a mere 130 miles from the Hanoverian capital. North Britain's most popular newspaper, the *Caledonian Mercury*, described in fearful awe how 'the desperate Highlander's trusty broadsword and targe [is] headed by a person who can lie on straw, eat a dry crust, dine in five minutes and gain a battle in four'. But as the Hanoverian troops set out for Derby to face the Jacobite army, their opponents had suddenly, and quite unexpectedly, done an about-turn. The Jacobites' commander, Lord George Murray, had never much respected the Young Pretender, whom he considered something of a reckless adventurer. Should the rebels march on London, Murray had predicted a resounding defeat at the hands of the London militia. And to Charles Edward Stuart's utter dismay, his commander's motion for a retreat had won the vote.

Over the following four months, the Jacobite soldiers had travelled back into Scotland. George II's army was placed under the command of his fanatical, rotund son, William Augustus, the Duke of Cumberland, who led his men in pursuit of the withdrawing Jacobites. After four months of sidestepping one

another in a martial *pas de deux*, on 16 April 1746 the Hanoverians and the Jacobites finally met on Culloden Moor, a few miles north-east of Inverness. Stuart's army was sadly dispersed, ravenously hungry and had not slept for two days. By contrast Cumberland's men were well rested, well fed and outnumbered their opponents by around three thousand. The Battle of Culloden began chaotically at around one o'clock in the afternoon. Forty-five minutes later it was over. In that short duration, the time it takes to enjoy a soak in the bath, between 1500 and 2000 Jacobites lost their lives. Only fifty of Cumberland's men had died. It was the last military battle to this day to be fought on the island of Great Britain. Stuart had not been able to watch it's awful final throes. He had fled, ignominiously, with the cry 'Run, you cowardly Italian!' ringing in his ears, riding sixteen miles westward, towards Lovat's old stone fortress, Castle Dounie.

In the hours that followed the Battle of Culloden, the King's soldiers exercised little restraint in their retribution against the surviving rebels. One Hanoverian redcoat recalled that the 'moor was covered in blood; and our men, what with killing the enemy, dabbling their feet in the blood, and splashing one another, looked like so many butchers'. A decade after the event, the Scottish writer Tobias Smollett described the horrific aftermath of the battle:

> [The King's soldiers] laid waste the country with fire and sword . . . all the cattle and provision were carried off; the men were either shot upon the mountains, like wild beasts, or put to death in cold blood, without form of trial; the women, after having seen their husbands and fathers murdered, were subjected to brutal violation, and then turned out naked, with their children, to starve on the barren heaths . . . Those ministers of vengeance were so alert in the execution of their office, that in a few days there was neither house, cottage, man, nor beast, to be seen in the compass of fifty miles; all was ruin, silence, and desolation.

The bloodshed during and after Culloden earned Cumberland the nickname 'the Butcher' and the bitter quip that he should be made a member of the Worshipful Company of Butchers.

On Stuart's arrival at Castle Dounie, Lovat realised that neither man was safe for long. After a long, fraught career, Lovat had become infamous for his

duplicity. Switching his allegiance back and forth between the Pretender's ancestors and those of the Hanoverian king had landed him with a conviction for high treason, a death sentence (later quashed through Lovat's notorious charm), outlawry, arrest in France as a double agent and a significant spell in the Bastille prison. During the rebellion of 1745–6 Lovat, who was then an elderly man, had tried to stay out of sight, placing his son in charge of the Fraser clan and commanding him to support the Young Pretender's cause, while he himself feigned illness and took to his bed. But as the rebellion had escalated and even seemed likely to succeed, Lovat's enthusiasm had got the better of him. He had left his bed to openly rally the rebels against the King with such zest that one journalist described him as 'the chief Author and Contriver of this wicked Scene'.

When Stuart told Lovat of the relish with which the King's forces had dispatched the rebels at Culloden, the old man realised how false was his hope that, should the rebellion fail, no government 'would be so cruel, as to endeavour to extirpate the whole Remains of the Highlanders'. An impassioned conversation took place between the two men in which Lovat tried to persuade the Young Pretender to make one further attempt, invoking the memory of Robert the Bruce's multiple defeats and his eventual success. But Stuart was disconsolate, and sought only a safe escape back to the Continent. Lovat concluded that, as an old sparring partner had recently put it to him, 'the double Game you have played for some Time past' was up.

On the morning of 17 April 1746, Lovat, Stuart and their retinues fled west into the Scottish Highlands. Numerous pamphlets published later that year liked to imagine them scaling the peak of Sgúrr a'Choir Ghlais, one of Scotland's most inaccessible mountains. From the hill's summit, over 3500 feet above sea level, the two men would have gazed over an extensive panorama of destruction, as George II's redcoated soldiers mercilessly pursued the fleeing rebels: 'Heaps of their Men lying in their Blood; others flying before their Enemies; Fire and Sword raging everywhere, and a great deal of it upon [Lovat's] own Estate, and among his Tenants.' The redcoats pursued a brutal strategy to subdue rebel clans to the King's authority in the months after the battle. They seized livestock, horses, gold and coin from

the Highlanders, and burned houses and farms to the ground under a variety of pretexts, such as the failure to deliver up fugitive rebels, refusal to surrender weapons or sometimes for the sheer joy of pillaging. One soldier, who was posted at Fort Augustus in the summer of 1746, recalled: 'we had near twenty Thousand Head of Cattle brought in, such as Oxen, Horses, Sheep, and Goats, taken from the Rebels (whose Houses we also frequently plundered and burnt) by Parties sent out for them, and in Search of the Pretender; so that great Numbers of our Men grew rich by their Shares in the Spoil'. The redcoats were intent on driving out supporters of the Young Pretender from every corner of the Scottish Highlands. They sought to 'put an end' to the spirit of Jacobitism 'so effectually now, that it will never be able to break out again'.

Looking down on this scene of murder and horror, Lovat and Stuart decided to part company. It was the last time they would meet. The Young Pretender fled towards the Western Isles but Lovat made his way alone to Loch a'Mhuillidh, a small piece of water seventeen miles west of Castle Dounie in the midst of Glen Strathfarrar, where he turned a bothy on a small island midway down the loch into a temporary home. When the King's soldiers closed in on the glen, his hideaway became untenable. Evading the redcoats, the old man travelled south-west, swiftly disappearing into a seemingly impenetrable cluster of peaks which he had known since childhood. Detailed maps of the Scottish Highlands now allow anyone to name these towering mountains: Sgúrr na Lapaich, Carn nan Gobhar, Sgúrr nan Clachan Geala, Braigh a'Choire Bhig, An Riabhachan, Mullach a'Ghlasthuill. We can trace their dramatic ascensions in closely bunched orange contour lines, quantify the immensity of their altitudes and pick out a safe path among teetering rocky outcrops, fields of boulders, vigorous streams and obscured lochs. But in 1746, the King's soldiers had no such assistance. They were beaten back by the formidable, seemingly unreadable scenery, and Lovat was able to make his way sixty miles south-west, unchallenged, around Loch Mullardoch, through the Kintail Forest, over the Five Sisters peaks, between Loch Hourn and Loch Quoich, through Glen Dessary, until, just short of the Scottish mainland's western extremity, he reached Loch Morar. Here Lovat secreted himself on an island towards the west end of the

vast lake with his Roman Catholic bishop, his secretary and a band of followers, and for the time being considered himself safe.

THROUGHOUT THE COURSE of the rebellion, the redcoats had suffered from poor intelligence about the Highlands' geography. This was exacerbated by inadequate maps of the region. The surveying of strategic sites such as fortifications and barracks across Scotland had been an integral part of military practice since the seventeenth century, and the flatter, gentrified landscapes of the Lowlands possessed a number of estate and county maps. But there was no complete map of the whole Scottish nation that provided an accurate overview of the Highlands' mountains, rivers, lochs and paths. In March 1746, only a month before Culloden, Captain Frederick Scott had written to his commander from Castle Stalker, a fifteenth-century tower-house poised on a picturesque islet on Loch Laich, in Appin, on Scotland's west coast. Scott's letter betrayed his frustration that 'this Place is not marked on any of our Maps'. He had also noted the differences between the place names on his chart and those actually used by the locals.

The same deficiencies hampered the soldiers in their pursuit of the rebels in the battle's aftermath. Charged with policing the country that Scott had found so difficult to negotiate, Major General John Campbell had commented: 'by the Map of the country it appears very easy & a short cutt to cross over from Appin by the end of Lismore to Strontian'. In reality, this required island-hopping across Loch Linnhe, followed by a lengthy pathless scramble over the steep rocky overhangs and mountain streams that punctuate the scrubby cluster of hills south-east of Strontian. No wonder Campbell had concluded that, contrary to the map's advice, 'I have had [the route] viewed and it is impracticable in every respect.'

The problems caused by these poor maps were aggravated by the extreme inaccessibility of the country in which many of the rebels were hiding. The soldiers complained of 'the Want of Roads . . . the Want of Accommodation, the supposed Ferocity of the Inhabitants, and the

Difference of Language'. Official reports warned that other parts of the Highlands were 'extensive, full of rugged, rocky mountains, having a multiplicity of Cavities, & a great part of these cover'd with wood & brush. The places are of difficult access, thro' narrow passes, & most adapted of any to concealment of all kinds.' A newspaper gloomily confirmed that 'there are Hiding-places enough'. Furthermore, the Highlanders' superior intelligence networks always seemed to be one step ahead of the soldiers. These networks extended north, south, east and west, giving advance warning of the soldiers' approach to fugitive rebels. One of the King's officers noted that 'our Detachments have always been betrayed by People that the Rebels had on the top of the High Hills, who by some Signall agreed on could always convey any Intelligence from one to another in a short space of time'. Conversely the redcoats found that their own 'Intelligence [was] very difficult to obtain, notwithstanding Promises of reward & recommendation of Mercy'.

Because of the Hanoverian troops' lack of good geographical intelligence in the face of such complicated scenery, Lord Lovat, a partially crippled near-octogenarian, was able to evade them for almost two months. He was eventually caught in the second week of June, when a division of redcoats towed their own boat over the peninsula that separated Loch Morar from the sea and rowed to his island. There they found 'that wily old Villain' hiding in a hollow tree, betrayed only by a glimpse of tartan through a chink in the trunk. Most of Lovat's followers had already dispersed, melting into the surrounding mountains like ghosts. The redcoats' Commander-in-Chief, the Duke of Cumberland, was intensely relieved: 'The taking [of] Lord Lovat is a greater Humiliation & Vexation to the Highlanders than any thing that could have happened,' he wrote jubilantly. 'They thought it impossible for any one to be taken, who had these [mountainous] Recesses open, as well known to him to retire to.'

Greatly enfeebled by his flight, Lovat was carried on a litter to Fort William at the southern end of the Great Glen, then to Fort Augustus at its heart and finally to the Tower of London. On 18 March 1747 he was found guilty of high treason for the second time in his life. But this time there was no escape. On 9 April Simon Fraser, 11th Lord Lovat, chief of

Clan Fraser, was executed, earning the dubious accolade of being the last person in Britain to be publicly beheaded. Meanwhile, the 'burning scent' of the Young Pretender had gone stone cold. Despite the assertion of one Hanoverian commander that 'I should with infinite Pleasure walk barefoot from Pole to Pole' to find him, Charles Edward Stuart had been able to secrete himself away in Scotland's western islands, before finally securing a voyage home to Italy, and safety.

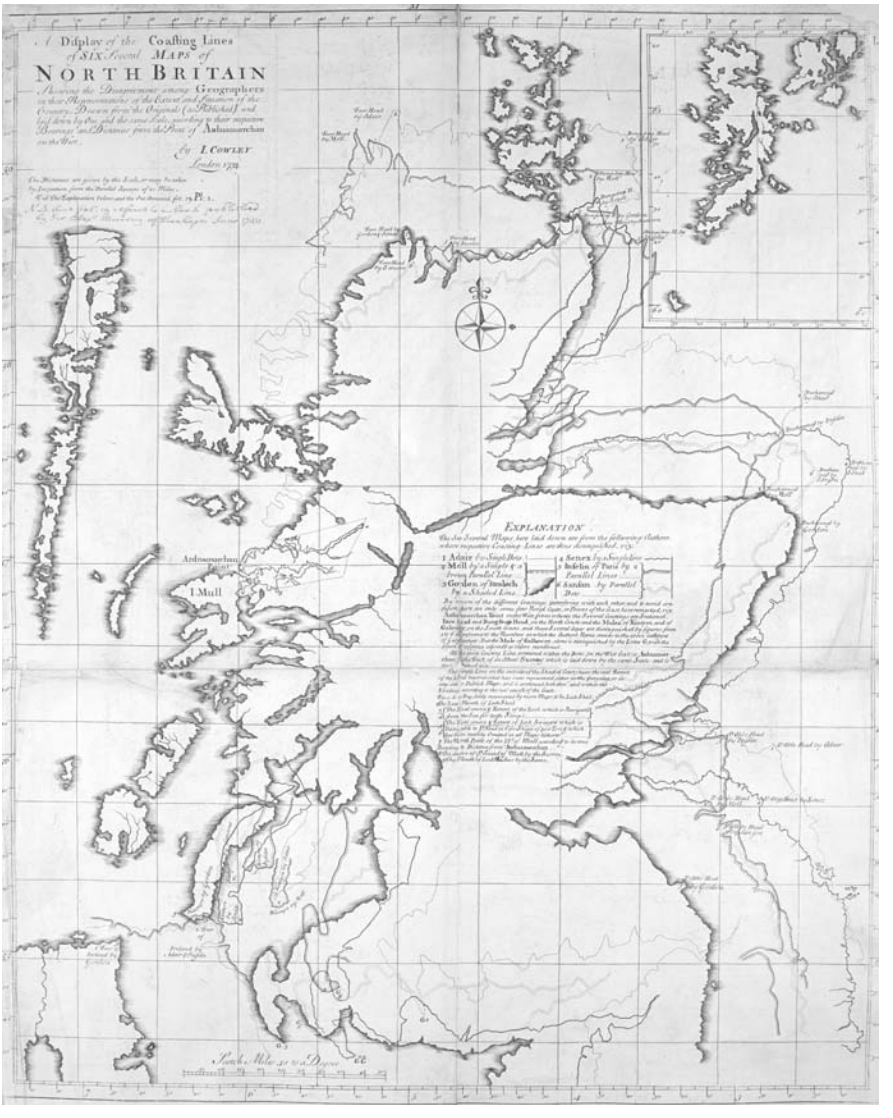
THE PERIOD THAT Lord Lovat spent in hiding from the King's troops marks a pivotal moment in the history of the nation's maps. It became unavoidably clear that the country lacked a good map of itself. Britain had national maps, but prior to the eighteenth century they had served a mostly symbolic function. When, in 1579, Christopher Saxton had published the first atlas of England and Wales, almost every sheet of his thirty-five maps was adorned with Elizabeth I's arms: Saxton's surveys were royalist insignia. Just over thirty years later, William Camden published the first English translation of his *Britannia*, in which his aim was overtly nationalistic. Camden wanted to celebrate 'the glory of the British name' by 'restor[ing] antiquity to Britaine, and Britaine to his antiquity', and his book's elaborately engraved frontispiece displayed a map surrounded by ancient icons of British patriotism, such as Stonehenge, to encapsulate this joined love of country and history. In 1610 John Speed had presented a county atlas to Britain's map-reading public, whose opening pages offered an exquisite, highly coloured map of 'Great Britaine and Ireland' beneath a coat of arms. An image of London in the top-right corner was balanced with one of Edinburgh in the top left, hinting perhaps at a convivial relationship between these capitals.

Although many early modern national maps were potent emblems of power, control, ownership and nationalism, their accuracy was often highly questionable. Surveys of nations were rarely made by measuring the ground itself, which was a time-consuming, skilled and expensive process. Instead,

1. The frontispiece to the 1600 edition of William Camden's Britannia.

map-makers tended to amalgamate information from a host of pre-existing maps to produce 'new' surveys, inevitably leading to the replication of old errors. And even when early surveyors did conduct their own measurements, many of their instruments and practices were the cause of further errors. The telescope was only invented at the beginning of the seventeenth century and it was not used at all in surveying instruments until 1670, which meant that map-makers' observations were restricted by the capabilities of their naked eyesight. After 1670 until around the middle of the eighteenth century, telescopic lenses were still liable to cause problems in the form of 'chromatic aberration', incongruous fringes of colour resulting from the lenses' failure to focus all colours to the same point. Accuracy in early map-making was further compromised by the susceptibility of many surveying instruments' materials to changes in temperature, which made them expand and contract. Chronometers and clocks had a frustrating tendency to speed up, slow down or stop altogether. And the measuring scales with which instruments were engraved were not sufficiently minute for a high level of accuracy, and mathematicians possessed no agreed method with which to reconcile conflicting results. Different maps of an identical piece of land could therefore look very dissimilar, and although estate maps were generally reliable enough for their owners' purposes, over larger areas errors proliferated. In 1734 a map-maker called John Cowley superimposed six existing maps of Scotland, and in doing so he created a striking image of radical divergence and disagreement. Some early map-makers did not even pretend to aspire to perfect truth and accuracy. The seventeenth-century Czech engraver Wenceslaus Hollar provided a telling admission of the limitations of early methods when he inscribed this motto onto one of his maps of London: 'The Scale's but small, Expect not truth in all.'

The 1745 Jacobite Rebellion vividly revealed the lack of, and need for, a complete and accurate map of the whole island of Britain. Over the next one hundred years, the myopia that had left Lovat's pursuers groping in the faintest of half-lights would lift agonisingly slowly until, at long last, Britons would be able to carry in their mind's eye, or in their pockets, a full and truthful image of the nation in which they lived.



2. A Display of the Coasting Lines of Six Several Maps of North Britain, *compiled by John Cowley in 1734, and revealing the severe discrepancies between early-eighteenth-century maps of Scotland.*

The story that follows is an account of how, why and where Britain's national mapping agency came into being. Today the Ordnance Survey is easy to take for granted. From the Shetland Isles in the furthest north-easterly reaches of Britain,

3. A detail from A New Map of the Cittyes of London and Westminster, *published around 1680 and attributed to Wenceslaus Hollar.*

to Penzance and the Scilly Isles in the south-west, it has surveyed every mile of the nation, dividing it into a cubist jigsaw of overlapping sheets. Today the Ordnance Survey's *Explorer* series covers Britain in 403 maps, and the *Landranger* series in 204. Each region, however inaccessible and forbidding, however urban and congested, possesses its own highly detailed map on a range of scales and with near-perfect accuracy. These surveys intimately trace the course of all the roads, national trails, minor footpaths, bridleways, power cables, becks, gills, streams, brooks and field boundaries that bisect a landscape of miniature woods, speckled scree slopes and orange contour lines. Black and blue icons represent sites of public interest, ranging from public toilets and telephones to National Trust properties and ancient ruins. In addition to its folded maps, the Ordnance Survey is also the source of the information contained in many A–Z street atlases, road maps, and walking and tourist guides published in the United Kingdom. Its depictions of the landscape fill the screens of 'satnavs' and similar hand-held navigational devices. The Ordnance Survey's massive digital database, the OS Master-Map, provides geographical data to a host of hungry consumers: national and local governments, transport organisations, the

Army and Navy, the emergency services, the National Health Service, housing associations, architects and insurance companies.

The national mapping agency has established a secure place in the affections of the modern British public. Ramblers lovingly fold dog-eared maps into plastic wallets to protect them from the country's soggy climate. Hikers become cheerily infuriated when the maps, like the nation's newspapers, refuse to crease cleanly at the required section and flap as capriciously as kites in sudden gusts of wind. At home, outspread across a carpet or table, OS maps display Britain's landscape in such vivid and exact detail that walkers can conjure in their imagination the course of eagerly anticipated or fondly remembered hikes, translating contours into visionary mountains and thin black lines into fantastical drystone walls. And the Ordnance Survey has left traces of its remarkable undertaking in the very landscape it mapped. Triangulation stations, or 'trig points', are those squat concrete pillars that hunker down amid rocks, heather or grass in the nation's most panoramic spots, precisely marking the points at which the OS's mapmakers placed their instruments. There are over five thousand in England alone, and trig points have become an obsession in their own right: members of the United Kingdom's 'Trigpointing Community' hunt after the pillars like prey. They have been described as one of the most beloved 'icons of England'.

This book describes the circumstances that led to the creation of the First Series of Ordnance Survey maps. It is usually said that the Ordnance Survey was born in 1791, when the Master-General of the Army's Board of Ordnance paid £373 14s for a high-quality surveying instrument and appointed the first three employees of a nationwide map. But in the following pages we will see how tricky it is to assign a decisive date to the start of that project. Arguably it really commenced in 1783, when a team of French astronomers approached the Royal Society to instigate a measurement between the observatories at Paris and Greenwich, a measurement that would form the backbone of the Ordnance Survey's early work. The year 1766 is also a key moment in its gestation, when a far-sighted Scottish surveyor petitioned the King to set up 'a General Military Map of England'. And it could even be suggested that the Ordnance Survey was first conceived twenty years earlier, from a map of Scotland that was conducted by that

same surveyor in the wake of Culloden. Recognising all these landmarks that paved the way to the Ordnance Survey's completion of its First Series, this book reflects on what it was like to inhabit a nation that lacked a map of itself and how it felt to acquire that mirror.

At the same time as the Ordnance Survey was coming into being as a deeply loved and much-needed institution, the United Kingdom itself was also being formed through unions between England, Scotland and Ireland, and through the growth of national networks of travel, tourism and communications. Mile by mile, the Ordnance Survey painstakingly created an exquisite monochrome image of that new state, and the following pages describe how the changing face of the nation placed ever-increasing demands on the maps. But those requirements often led the map-makers astray from their principal focus, the creation of the First Series, so that – thanks to a wealth of fascinating digressions and distractions – it took seventy-nine years before those maps were completed in 1870. When that moment finally occurred, it was a landmark in Britain's history, similar to the publication of the first edition of the *Oxford English Dictionary* in 1928. Both events gave the reading public deeper and wider insights into the physical and intellectual landscapes in which we live our lives.

For its readers today, the name 'Ordnance Survey' may conjure up a Betjemanesque image of cycle-touring or hiking through idyllic pockets of the British countryside, with only a map or guidebook for company. But as we shall see, its surveys emerged largely from a long history of *military* map-making, in which that landscape was tramped over not by ramblers with a walking stick and a bag of sandwiches, but by redcoated soldiers.[1] During the Enlightenment, cartography became a symbol of the taxonomic intellect of the rational thinker, but philosophers were not the only ones to benefit.[2]

1 *Survey* has a much wider range of meanings than *map*, referring to sweeping representations of the world in words as well as in images. But to avoid excessive repetition of the word 'map', I will use the two terms largely interchangeably, clearly differentiating them where necessary.
2 The word *cartography* refers to 'the drawing of charts or maps' and derives from the French *carte,* card or chart, and Greek *γραφία*, writing. Although it is a useful term that crops up frequently in this book, it is important to note that the word was only coined around 1859 and therefore was not used by the Ordnance Survey's earliest map-makers and readers.

Soldiers also became more 'map-minded' in this period, and the military was one of the principal crusaders in the improvement of British cartography over the course of the eighteenth century.

This book reveals a nation waking up, opening its eyes fully for the first time to the natural beauty, urban bustle and tantalising potential of its landscape. The ensuing chapters tell the stories of those who directed the Ordnance Survey's early course: scientists, mathematicians, leaders, soldiers, walkers, artists and dreamers. They relate the hostility and intermittent friendship that characterised the fraught relationship between England and France over a century in which a prolonged and violent series of wars repeatedly set one against the other: an awkward backdrop, as we can imagine, for Anglo-French map-making collaborations. They describe the inanimate celebrities of the Ordnance Survey's project – the most advanced, accurate, intricate measuring instruments that had ever existed; and the reactions of the maps' first consumers, which ranged from loving adulation to protest. But above all, this book recounts one of the great British adventure stories: the heroic tale of making from scratch the first complete and truly accurate maps of a nation.