Cetacean Citations and the Covenant of Iron.

Abstract: By the early decades of the nineteenth century, with surveys established as the weapon of choice for the fiscal-military state, their instrumentation provided a focal point for radical attacks on political establishments. This paper considers a notorious dispute over mastery of iron in the instrumentation of magnetic surveying that took place in the 1830s between an Admiralty committee and the Reverend William Scoresby, a whaler turned clergyman. Scoresby staked his claim by drawing on the labour law of the whaleboats, a culture peculiarly preoccupied with the properties of bone and blubber, ink and skin, parchment and iron, where magnetism was forged in the "combinations", as Scoresby put it, of such specific materials. The enterprises of his most avid reader, peer and fellow labour rights activist, Herman Melville, bring to presence the salience of Scoresby's struggle with Admiralty authority. The eminent Australian scholar Greg Dening's approach to ethnohistory proves the appropriate instrument with which to analyse such an encounter between traditions, negotiated through material forms. In the fraught exchange between whaler and maritime state, the combination laws that helped prompt the threat of revolution in early nineteenth century Britain were translated into Scoresby's iron. Extant material and archival collections in Greenwich and Whitby offer traces of a battle between ways of knowing this protean metal; 'not down in any map; true places never are'.

Introduction

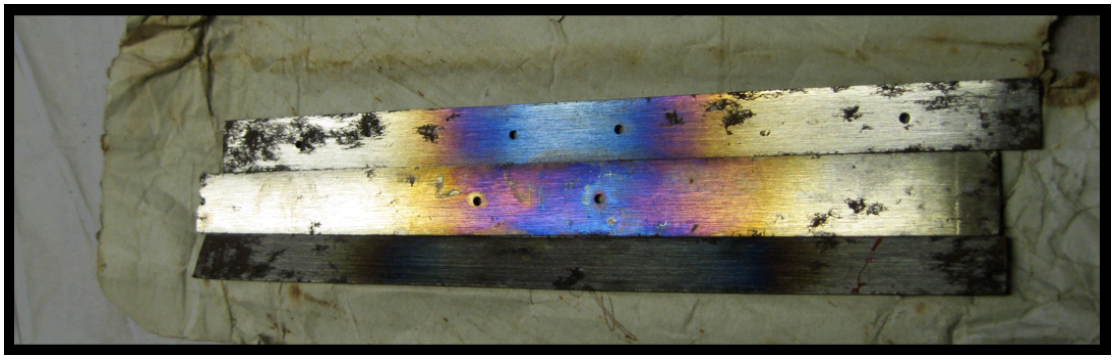

Figure 1: Two tempered steel needles forged by William Scoresby Jnr from a stack labeled by him: '5 plates used for exp^{t} on effect of Reducing the Temper in the Middle' WHITM:SCO184. Reproduced by kind permission of Whitby Museum. The manufacture and trial of these needles is described in 'Powers of Magnetic Combinations', Scoresby *op.cit.* (note 103), pp.148-9.

This is a paper about the material culture of survey science: a culture which, in the early decades of the nineteenth century, was significantly forged from whaling law and iron, and the materials that bind them: wrappings of parchment, hemp, ink, and skin that defined social and material spaces, labour relations and territories. Whalers played an indispensible role in shaping early nineteenth century global maritime surveying, and of these hunter-hydrographers, the evangelical William Scoresby junior, was the most famous.

In the 1980s Brian Harley radically challenged the then widely accepted view that European mapping was an ideal form of objective knowledge, and that the maps generated unproblematic statements of facts about the earth's surface. Influenced by Foucault and Derrida, Harley showed that map-making was the deliberate ordering of knowledge to serve social and political interests. He showed that the development of survey science was inextricable from the development of the state; and, further, that this entangled development could be seen most strongly in the early decades of the nineteenth century. Following Harley and heavily influenced by Foucault's seminal work *Surveiller et Punir*, a study in the discipline of bodies through surveillance and thus the

essence of the state-driven survey, subsequent literature on mapping emphasised the all-seeing gaze of the map-maker, foregrounding the work of bureaucrats and administrators based in metropolitan centres. Despite Harley's critical acknowledgment of the map as a tool of power and oppression, the deployment of his work by subsequent historians thus often reproduced the powerful inequality it described and sought to criticise. In countering this unfortunate development, historians have increasingly turned to practice, and in particular to studies of collaboration and resistance in the enterprise of constructing the map. Yet with this awareness, the scale of the methodological challenge has dramatically increased. Resistance, collaboration and even apathy point to the complexity of power relations embodied in the map.[1] This convergence of relations is necessarily an encounter between different and contrasted individual traditions. How then to acknowledge the apparently monolithic force of the state, whilst at the same time attending to the nuance and heterogeneity of individuals, within and outside the state's institutional traditions, without deforming these individual interests as merely subordinated to its priorities?

This paper is an argument for an alternative methodology. Here, iron, paper and skin afford a more symmetrical account of the fraught power relations embodied in the work of early nineteenth century survey science. It takes as its focus the instrumentation of magnetic surveying, a science then pivotal to the interests of British maritime power, as it was central to the concerns of those natural philosophers that dominated the leading scientific societies. The paper is based on intense research on a substantial collection of iron samples in Whitby, amassed by Scoresby in the course of his famous magnetical investigations. The argument comes directly from those specific Whitby objects and their peculiar properties. This study through materials does not presume to tell the history of the world in a hundred objects, but rather to see that 'there is a world' and 'there are a hundred worlds in each thing'.[2] The methodology proposed is not perturbed by the 'limits of localism'.[3] Materials and production processes are shown to be powerful tools in moving analytically not only between the local geography of microstudies and the broader significance of major global consequences, but also between different traditions. This study is founded in the peculiar local relations of these materials: the many worlds in each one.

On his death in 1857, in addition to three cases of his researches, twenty-one boxes of papers, and material stowed in the basement such as a harpoon with "Scoresby" cast into the iron, Scoresby personally endowed the Whitby Museum with a Grand Cabinet. In its imposing frame a dozen compartments: for every compartment a hundred worlds traced in iron. Apart from the summary catalogue compiled by Anita McConnell in the 1980s,[4] and important recent work by Scoresby Curator Fiona Barnard, this collection remains almost entirely untouched since the bequest. So tightly wrapped are the objects in parchment and thread by Scoresby, that, despite the vitiating effect of storing magnets together, this 180 year old iron still retains the strength of its original attraction. The evangelical whaler bound iron in parchment with details of date, foundry and treatment - from temperature, through how many hammer blows, to the resulting properties: soft or brittle, weak or strong. The researcher, encountering Scoresby's iron obsession for the first time, and beginning, tentatively, to unwrap layers of paper to reveal layers of metal, is struck, not just by the care, but by the *colour*. Alongside layering, wrapping, and binding, it is the colours of temper that characterise Scoresby's collection; not only the blue of steel heated to a spring temper, or just under, to a peacock purple, but the spectrum, the rainbow of iron tempers (Figure 1). Parchment wrapped, rainbow scorched, and bound in combination, these are the peculiar characteristics, specific to Scoresby's iron samples, and the direct source of this argument.

While the analytical tools of historians of science are often deft on inscription, they are just as often deaf to the utterances in materials. Scoresby's iron is notorious as the stuff

of several fierce disputes between himself and the Admiralty over property and intellectual territories.[5] In the 1838 conflict, central to this paper, each side in the encounter interpreted what was new in the light of what was old, specifically in the light of different overlapping traditions. Through this interpretive activity, encounter itself added to the combination of traditions, both consolidating and changing difference.[6] In his seminal *Performances*, Greg Dening defined the term *ethnohistory* in the work of trying to describe such changing and exchanging. He wrote, 'I do ethnohistory wherever the ethnographic moments of everyday life make cultured being', going on to give an exquisite account of encounter, not least in the cultural utterances of materials.[7] This is the adroit analysis for Scoresby's wrappings, his iron, and the rainbow in the metal.

That Dening developed his ethnohistory studying the Pacific is crucial to this paper. In the early decades of the nineteenth century, heroic narratives of exploration constructed the Arctic as a theatre in the model of the 'Pacific theatre' that had dominated the British maritime eighteenth century.[8] Among these, Scoresby's *Account of the Arctic Regions,* a natural history of the Greenland whale fisheries, was one of the most famous.[9] To understand Scoresby's iron it is necessary first to look to the Pacific: Polynesian culture and the dramatic properties of skin and ink provide critical analytical resources, intimately entangled with Scoresby's own history. Scoresby's history, in turn, mattered, for Herman Melville's famous analysis of ego torn between ruthless totalitarian and capitalist systems, his 1851 work *Moby-Dick; or The Whale*.[10] In a move typical of the novel, Melville inverted the displacement, making the Pacific the theatre for the Arctic drama, and so the theatre for the fraught labour relations and social, economic, and political injustice which preoccupied so much of Scoresby's work. The composition of *Moby-Dick* came at the end of a decade in which Melville and his family were closely implicated in the struggle around labour laws and slavery in the United States. It was precisely these concerns that brought the Boston novelist and Whitby whaler into such close physical and intellectual proximity; and made Melville, Scoresby's finest reader. In this paper, skin and ink teach lessons about the cultures of iron; cultural iron teaches about ego; and Melville's epic of ego teaches about labour law in an industrial age of iron. These traditions were the critical but often-unmarked resources for the instrumentation of the survey sciences, mobilised by the British fiscal military state.

Iron, paper, and skin.

Ishmael, Melville's persona in *Moby-Dick,* devotes a chapter to the biography of his closest friend, the harpooner Queequeg,[11] covered in 'unearthly tattooings', born the son of a South Sea Island King.[12] It begins citing Queequeg's place of origin: 'an island far away to the west and south… not down in any map; true places never are.'[13] The line is significant for the specifics of this argument, a paper on survey sciences concerned less with the power relations projected by the map, than those embodied in the material culture of mapping. Nineteenth century whalers, whether Polynesian, American, or European, knew places that did not even exist to cartographers. Melville's Queequeg, and his tattoos, were inspired by an account of a Maori Ngāti Toa king of kings named Te Pehi Kupe who visited Liverpool in the 1820s, and drew his face for Scoresby's closest friend,[14] physician and founder of the Liverpool Mechanics' School of Arts,[15] Dr Thomas Traill. Te Pehi Kupe's *moko*, (Figure 2) was the individual tattooed mark of his Maori communal identity, his social, physical, and cosmological relations, embodied.[16] Some maps do show true places: relations embodied in iron, paper, and skin.

Figure 2: Te Pehi Kupe's *moko*, drawn by himself. G. Craik, *The New Zealanders*, (London: Charles Knight, 1830), at p.317. Image credit: Private collection.

Te Pehi Kupe's arrival in Liverpool was marked by sickness. Physically marked. He had measles, and the scars of the port town joined with those of the ink on his skin.[17] It was Traill who was called to attend to the paramount chief. Patient and Doctor bonded, and Traill took it upon himself to be Te Pehi Kupe's guide around what historians have dubbed the peculiar 'nautical vortex' of Liverpool,[18] governed by its transatlantic trade and an oligarchy of ironmasters and shipping magnates.[19] These events coincided with Scoresby's appointment as the first chaplain of Liverpool's Floating Chapel, the heavily armed HMS *Tees,* abandoned by the Admiralty as a wreck. When Scoresby joined the clergy in 1823 he had been Traill's closest friend for five years, and a whaler for over two decades. While Traill showed Te Pehi Kupe round Liverpool's churches,[20] Scoresby took up his pulpit and congregation of mariners in the hulk of the 40gun frigate.[21] His was an encounter between ancient traditions: military, maritime, and gospel. Scoresby's interpretation, that saw what was new in the light of what was old, is of critical importance to the ethnohistorical argument of this paper. In this naval warship converted for worship, he preached surrounded by the ruins of the state, and its brutal systems of discipline.

From this dramatic stage Scoresby moved to Bedford Chapel, Exeter in 1832, before taking up the role of vicar to the large, industrial, dissenting parish of Bradford in 1838. Here he became intensely involved in factory working conditions, and in particular the

exploitation of women. So preoccupied was he, and so impressed by the comparative conditions of women workers he witnessed in Lowell, Massachusetts while on a preaching tour of America in 1844, that his thought and rhetoric developed around the Lowell factory system as a model for a better society, in both Britain and America. First published in 1845, Scoresby's *American Factories and their female operatives* was immediately printed and distributed in London and in Melville's hometown of Boston,[22] glowingly reviewed in the *Boston Daily Advertiser*.[23] When he crossed the Atlantic again in October 1847 his preaching tour of Canada and the States was to begin and end there, spending the winter of 1847 and subsequent spring in Boston before returning to England in early March 1848.

Melville, himself a former whaler, already held Scoresby in high regard, as the 'best existing authority… renowned Right whaleman… I honour him for a veteran'.[24] But in the late 1840s they shared a further point of communion: a terrible fascination with the horror of factory conditions, evinced most strongly in the work of women operatives in textile mills. As C.L.R. James's seminal analysis has testified, Ahab's whaleboat, the *Pequod,* was itself a factory, and Melville's epic of ego and whale hunt a ferocious critique of the labour relations of capitalist and totalitarian regimes.[25] The second section of this paper explores how, long before he came to the plight of the female operatives, Scoresby looked to an American system to resolve labour relations by wrapping iron in parchment. Melville, meanwhile, was inspired to write on the labour relations of paper when he encountered the burgeoning industry of New England's Berkshire paper mills, in May 1850, as he read Scoresby's writings and worked on the composition of *Moby-Dick*.[26]

Just a few months earlier, in the winter of 1849, and the same year as the journalist Karl Marx, the novelist had visited London. It was a sight he likened to 'a view of hell', the fashions of dandies woven by broken bodies clothed in rags, in a culture that was all-consuming.[27] Cloth to the Boston-born novelist meant cotton, and cotton meant slavery.[28] Recent work by Stefan Schöberlein has shown how Melville's time in London directly informed his experience of the Massachusetts paper mills, seeing cotton rags and the bodies of factory workers rendered down to make paper, in what Marx described as a 'twofold slavery' of vampiric logic. Schöberlein quotes the observation of Claude Levi-Strauss, father of structural anthropology, that in a society produced and maintained by paper bureaucracy and legislation 'without end', the 'primary function of written communication is to facilitate slavery'.[29] Levi-Strauss was commenting on an infrastructure established in its most acute and salient irony a hundred years before, in the mid-nineteenth century, when the paper that made the institutions of justice and marriage was a material rendered from the bodies of black slaves and white factory workers. Melville saw this twofold slavery unfold with horror, from his position newly-bound in marriage to the daughter of a Boston law-maker, at the fraught center of abolition debates.

Scoresby and Meville were not only inspired by, but also significant commentators on one of the seminal struggles of the age: the very right of workers to act collectively, as combinations, to resist brutal systems of labour extraction in industrial production. This right had been violently and oppressively legislated against in Britain since the turn of the century under a series of acts known as the Combination Laws. The legislation was imposed to prohibit workers uniting for political reform, and to make any attempt to influence commerce and trade, a criminal act. Nonetheless combinations were formed, so in 1824 in a bid for tighter regulation, and in particular, to break the negotiating power of the virulent London silk weavers, they were briefly de-criminalised. Within a year, and following panic at the apparent surge activity, the Combination Laws were reinstated in modified form.[30] Small legal recognition was granted permitting occasional meetings of workmen to discuss the level of wages at which they might be willing to sell their labour.[31] It was a concession specifically designed to bring combinations under

harness within a system subject to constant surveillance. Scoresby commented directly on the inherent contradiction of this license in his 1845 *American Factories.* He argued that while combinations were a powerful defense against the 'avarice' and 'arbitrary and unreasonable' behavior of individual capitalists, it was precisely these cases in which combinations were criminalized. By contrast, they were granted illusory license where they were powerless: against the fluctuating market value of labour.[32]

In 1806 a critical case in American labour law, the Philadelphia Cordwainers, had unusually, followed British law in judging striking workers to be illegal conspirators, and combinations, illegal. This strict adherence to the British system came under intense scrutiny precisely in Melville's hometown of Boston in the late 1830s and early 1840s, following a strike staged by the Bootmakers. In March 1842, Chief Justice Lemuel Shaw of the Massachusetts Supreme Judicial Court, Boston, took the Bootmakers' strike to rule that labour combinations might enjoy some, highly contingent, legality.[33] The decision is remembered as 'the Magna Carta of American trade-unionism', [34] and it hinged significantly on whether English legislation, here the punitive Combination Laws, could be applied to American labour law.[35] Shaw was already Melville's close friend and advisor, but, on 4 April 1847, the law-maker became his father-in-law, in a ceremony overshadowed by the publication of Melville's novel *Typee*.[36] The year before Melville had presented Shaw with 'one of the first bound copies of "Typee" he could procure', inscribed with a dedication to the strength of their long-standing mutual affection.[37] The novel, an early tentative effort by Melville to engage with salient debates of skin colour, bondage and revolt,[38] was a gift of great significance to the union.

In 1842, the same year as his landmark ruling against the application of British Combination Laws to American labour law, Shaw became infamous for ordering the return of the slave, George Latimer, to Virginia. Some 50,000 citizens signed a petition protesting his decision. Melville's *Typee* was an important if underdeveloped criticism of Shaw's position on slavery. This point of conflict between the two friends turned father and son, emerged again in 1851 with the notorious case of Thomas Simms, a fugitive slave from Georgia. In a court encircled with iron chains and armed guards, Shaw ordered Simms' return to Savannah to be publicly flogged. The Fugitive Slave Act had taken effect in September 1850 and in that same month Melville began to radically rewrite the text of *Moby-Dick*. The nascent criticism in *Typee* became a prototype of the more complex character of Queequeg.[39] The tyrannies of human bondage, and collective resistance by combination, were the shared traditions of Scoresby and Melville's overlapping worlds, and, as in the trial of Simms, they were marked in iron, paper, and skin.

Between 29 April 1850 and 14 June 1851, while he worked on the composition of *Moby-Dick*, Melville pored over Scoresby's two volume *Account of the Arctic Regions*, and his *Journal of a Voyage to the Northern Whale-Fishery*.[40] While the novelist made frequent reference to Scoresby's authority in his *Account*,[41] *Journal* was a direct source for dramatic material*.* In Chapter CXXIV, 'The Needle', Ahab discovers that lightning has reversed the magnetism of the ships' compasses, and, to the amazement of his crew, forges a new compass from ship's iron, a sewing needle and thread.[42] The scene is identical to an episode in Scoresby's *Journal* where Scoresby describes in detail the process of forging a compass from ship's metal.[43] Melville articulated what was salient to Scoresby's tradition: this mechanical performance was political theatre. Ahab cursing the sun and smashing his quadrant, 'plaything of haughty Admirals, and Commodores, and Captains', was, C.L.R. James argued 'one of Melville's profoundest penetrations into the nature of totalitarianism.'[44] Power enacted in the skill of his iron-working and the awe of the crew, in James's words 'science, the management of things' and 'politics, the management of men',[45] analysed both whalers' place in relation to other powers, namely God and the regulatory state.

This took place on Scoresby's ship *Resolution*, in May 1822. Seventeen days earlier, in the *Journal,* so carefully studied by Melville, Scoresby had documented the rituals of the Greenland sailors ushering in 1 May. A sailor designated Neptune, would dress as the First Lord of the Admiralty, in naval uniform and cloak with an immense wig, boasting a mop made of rope yarn for the tail. This striking figure, 'carrying a huge hunch' and 'swollen bandied legs that rivalled the diameter of his body', would then proceed to interrogate a succession of 'non-freemen', hands not free of the Greenland sea, who were marked out with black and white patches applied to the face, and brought before him. On attempting to answer, the non-freeman would be shaved with a lather of grease and tar, and a 'coarse piece of iron-hooping' for a razor. Hands who had falsely shipped themselves as freemen, or proven to be mean and worthless characters, were introduced to the First Lord as '*hypocrites*', and ordered to go through the operation twice, on the principle that 'all hypocrites having two faces, it was necessary to scrape frequently and deeply, that the false face might be removed, and the true one appear.'[46]

Melville first introduces Queequeg through Ishmael's shock at 'the black squares' that 'checkered' the harpooner's face like he had 'been in a fight' and 'got dreadfully cut'. Having reassured himself that 'it's only his outside...' and 'a man can be honest in any sort of skin', Ishmael watches with fascination the next morning as Queequeg lathers and shaves his face with the blade of his harpoon.[47] The status of 'non-freeman' connotes slavery. Queequeg's tattoos were not just inspired by the Mayday ritual, and Te Pehi Kupe's *moko,* but like these were the material expression of a plurality of relations, a plurality of worlds. Mayday, *moko*, and Queequeg's shaving, were acts of representation where one tradition spoke to another. Dening points to the theatricality in any such act, a 'delicate, dangerous moment', nonetheless it is generative, 'it is the space created by the performance consciousness of the presenter in which the audience… participates in the creative process of representing'.[48] On board Scoresby's ship, the *Resolution,* the tension broke and moment of danger passed with summons from the boatswain to 'splice the main-brace', the act of repairing rope that had come to mean the combination of men joining in drink.[49]

In Scoresby's world social relations were defined by labour relations and ordered by marks on skin, paper and iron, against the constant grotesque 'marine potentate' of autocratic Admiralty power. Melville's reading of Scoresby, and his evocation of Scoresby's experience to mobilise social critique, are crucial to understanding how whaling served as a direct resource for Scoresby's famous geomagnetic cosmology: 'the law of combination in steel'.[50] The culture Scoresby drew upon for his science was precisely a culture eloquent in the management of people and of things. And for Scoresby his collection of rainbow-scorched iron (Figure 1), formed in the late 1830s after he was humiliated in a dispute with the Admiralty over property, magnetism, and materials, was the most eloquent medium of these complex relations, these many tangled worlds.

While Scoresby's needles, now in Whitby, were wrapped and bound in marked parchment, the Admiralty's needles were without wrapping or marking.[51] Both are tempered, but where Scoresby's display the rainbow of temper colours, from the pale yellow suitable for lathe tools for brass, and brown for wood turning, through to the dark purple of cold forging tools and blue of spring steel, the Admiralty needles are an even spring temper, without colour, the bright blue polished away. In the 1850s Scoresby and the Admiralty would come into conflict once again, the dispute reframed as Scoresby's popular evangelism defeated by Admiralty rational orthodoxy.[52] But in 1838, with a committee of influential evangelicals, such as hydrographer to the Admiralty, Francis Beaufort, and East India Company surveyor Thomas Best Jervis, the conflict was not religious, but rather something relational, that, in the course of the dispute, would come to be described in the iron.

Unhappy straits

Whaling was fundamentally a group endeavour; in particular Arctic whaling, where a catch depended on watching other ships and sharing information about ice conditions.[53] Success or failure hung on the union of several ships for the pursuit of a common object – to kill a whale. The leviathan 'fish' were known as *kings*, after an ancient royal privilege to the head of the kill.[54] Whalers united in the industrial, political sense, in combinations, to kill kings, and these combinations were maintained on systems of mutual agreement over the division of property, a covenant embodied in the iron. Community was in constant tension with the rights and claims of the individual, at both the level of the ship as a whole, and between captain and crew. Melville chose to describe the body of the whale as a textile factory, the highest articulation of the division of labour. To the former whaler the very flesh of the leviathan 'fish' was the substance of labour relations. This section will show how, in moments of crisis, iron wrapped in parchment could resolve the tension of labour relations in the body of the whale.

For Scoresby, two systems of property were in competition. First, 'fast fish, loose fish', the dominant system in the Greenland Fisheries since the 1780s, 'Alive or dead a fish is fast, when it is connected with a ship by any medium at all controllable by the occupants… -a mast, an oar, a nine-inch cable, or a strand of cobweb it is all the same'.[55] The first ship to get a line in a whale, and hold that line, owned that whale, a possession that was retained so long as the connection held, but once a whale was loose, regardless of the circumstances, it was free for the taking. The second system was 'iron holds the whale'. Here, the first boat to strike retained its claim even without an attached line, as long as the harpoon was properly marked, remained in the whale, and the ship remained in pursuit.[56]

Scoresby specifically described the labour law of the Arctic, a law of the line, where the 'fast-fish loose-fish' system, was long established. What his description conveyed, however, is a tension between the two systems: '[i]n each foreganger [a piece of rope, of the best hemp spliced closely round the shank of the harpoon] was a printed parchment… The use of these marks is for identifying the harpoon in case of a dispute… Disputes which might otherwise have extended to litigation, have by this simple precaution, been frequently prevented.' And again, '[e]very harpoon is stamped with the name of the ship to which is belongs; and when prepared for use, a private mark, containing the name of the ship and master, with the date of the year, is concealed beneath some rope yarns wound round the socket of the instrument.'[57] Even for the Arctic whalers, long established in the 'fast-fish loose-fish' system, 'iron holds', the law of iron wrapped and bound in marked parchment, still exerted a decisive influence. The two systems were in tension, mediated, as we shall see, by 'laws of honour', based on religious, biblical authority. By the late 1810s Scoresby insisted on 'iron-holds' as a more honourable, more godly, system; a preference formed five years earlier, in a crisis.[58] In 1811 Scoresby's father had gifted his son command of whaling vessel the *Resolution,* while himself taking command of the *John.* In summer of 1812, father and son clashed oars over a whale.

On Tuesday 21 July there were clear skies and clear seas off Greenland as the whalers encountered a thick run of 'fish'. The *John* got first iron in a whale, but, unable to keep pace, lost the line and it was left to the *Resolution* to bring her in, 'when a query arose whose Fish it was… a loose fish is fair game to any person'. *But*, wrote Scoresby, 'we should not have got the Fish if they had not struck her first.' Honour and iron were for his father, but the men enforced the law of the line, towing the whale alongside 'whilst the *John*'s Crew quietly retired to their Ship… My Father was wroth I argued with our Crew but they (according to the law) were stubborn for their right and swore the John should not have their property. Newly Captain of the *Resolution,* Scoresby found himself

in 'an unhappy strait', pleading for an iron-holds system. A day that had begun bright with clear seas was now overcast.

> left by my Father in the heat of his displeasure threatening to enforce the law.. attributing all the blame to me.. I arose from my bed in a very unwell state. The fish being flinched we worked up towards the John, made fast to a floe watering… The ice seemed to have *quite* enclosed us.[59]

While Scoresby projected his emotional turmoil onto the environment around him - the 'unhappy strait', the ice that closed in upon them - the decision had, in every real sense, already been made; not by Captains but by the combination. Though Scoresby pleaded with his crew, they ignored him and towed the 'fish' alongside; while the *John's* crew, in direct opposition to Scoresby senior's violent protest, marked their agreement by quietly retiring to their Ship.

The authority of the combination of men was sealed as follows: a fast 'fish' could always come loose, and no whale was truly secured until the great bulk of the 'fish' had been hoisted alongside, and the flinching, or flensing, done. In moments of crisis the highest authority was not the words of a captain, but rather the labour of the combination - the hoist and loading of blubber whereby a system of enormous iron hooks on chains and pulley blocks, unravelled the whale in segments of blubber, a ton a piece, and packed it into barrels. The whales, the packing forks, and the men who did the packing, were all called *kings*, characteristic of whaling culture that endowed animals and objects with human properties and agency. The *kings* moniker recalled an ancient law which stipulated 'of all whales captured by anybody on the coast of [England] the King, as Honorary Grand Harpooner, must have the head,'[60] Scoresby himself noted this privilege had long since devolved to the First Lord of the Admiralty, [61] the same caricatured in the Mayday celebrations, dispensing rough justice to seamen's skin with his iron hoop razor. The authority of the Admiralty was an oppressive presence over the private industry of the whale ships. How iron mattered depended on a very specific set of relations: the property of iron depended on the particular combination.

An iron hold, Scoresby argued, was more just, more in keeping with 'the golden precept' of Matthew 7:12: 'Whatsoever ye would that men should do to you, do ye even so to them', than a fast or loose law of the line.[62] But an iron hold was only as good as the regulation of the combination of men; and, even in the moment when the 'fish' was finally secured, hoisted alongside and being packed into barrels, the Admiralty's levy could be heard in the language of kings.[63]

Knocking oars.

In 1807, in the aftermath of the bombardment of Copenhagen, the British government made a call upon all seamen, 'especially upon those engaged in the Greenland trade', to assist the Admiralty in bringing the captured Danish fleet into a British port. Scoresby was among the first to offer his services, but it would be a salutary experience, leading him to regret his impulsive support, denounce the injustice of seizing, by force, the fleet of a nation at peace; and question 'an opinion [he] had been taught to hold', namely 'that whatever government did must be right'.[64] On board the naval warship *Alfred*, the zealous eighteen-year old was horrified by 'the power [of the Captain] so unlimited and so arbitrary' who would carry out 'the most daring and unrelenting violations of every principle of justice and humanity.' Skin was the medium of his terror. 'Men were flogged without a specific fault – some without a shadow of a crime' and the sight of the flayed bodies 'writhing and groaning in the greatest agony' left the young Scoresby physically sick. 'Such tyrannies [he noted] loudly called for reform'.[65] This was Scoresby's first introduction to naval discipline. Thirty years before his dispute with the Admiralty, the young whaler saw the Admiralty as drunk on unchecked power, its moral compass awry.

Just as Scoresby's authority as a reforming preacher was based on his fame as a whaler,[66] so was his reputation as a man of science.[67] Specifically his 1820 *Account*, established the whaler as a household name, and authority on Arctic exploration and natural history. It was in this capacity, as priest and natural philosopher, that Scoresby addressed the Bristol meeting of the British Association for the Advancement of Science in August 1836. The *Athenaeum* introduced him as 'The Reverend Mr. Scoresby, better known to our readers as Captain Scoresby'.[68] The comment was apt, his authority was as a whaler, and his ambition for iron was to demonstrate the power of whaling resources to reform the survey sciences, not just in the Arctic, but cosmologically.

Scoresby attracted attention at this meeting with two instruments, the first a 'magnetimeter', built to measure magnetic attractions. So exquisitely sensitive was this instrument that it could detect the magnetic effect of the faintest touch on soft iron, and, for those who agreed with Scoresby that magnetic strength was founded in material structure, it could, he claimed, sense the relative goodness of different species of iron. The second was a variation compass, a fundamental component of survey science used to measure the difference between True North and Magnetic North. In his variation compass the needle was made from the layered busks of ladies' corsets, interposed with thin card-paper, to prevent touching, lest the inequalities of the individual materially weaken the combination of the whole. This 'combination', as Scoresby called it, was then suspended on a single untwisted fibre of silk.[69] In his first researches, Scoresby did not call the relation between ships' iron and the magnetic compass, 'attraction' as he would do later, adopting the language of his peers. Rather, in his earliest journals he uses the term 'attachment'.[70] From the first his notion of magnetism centred on the material combination of physical forms. Before he came to the term 'magnetimeter', again one favoured by the magnetic community, he took pride in his neologism, 'Elkusmosometer',[71] from the ancient Greek *helko* (*ἕλκω*), to pull, drag or draw. The etymology was significant for Scoresby the evangelical as it was for Scoresby the whaler. In John 21:6/11, the namesake for Scoresby's father's ship, *helko* combined fishing with the salvage of souls through the drawing of nets. For whaling culture such dragging meant literal salvage. Caught in unhappy straits, pressed in by ice on all sides, whalers depended on labourious dragging by rope to break a passage through; a process called *mill-dolling* after the prison labour of beating hemp.[72] Magnetism for Scoresby was as rope that bound iron to iron, whaler to whale, labour to property, and people to salvation.

Scoresby's choice of 'attachment' and 'Elkusmosmeter' were early indicators of what would become the strong embodiment of physical and social relations in his instruments, but the significance of the specific materials in the compass and magnetimeter he showed that day to the Bristol meeting went well beyond philology. His use of metal corset busks was significant. Whalebone was exclusively the product of baleen whales, and, in particular, the bowheads, which are specific to Arctic waters. Until the end of the eighteenth century whalebone was generally discarded. However, over the first decades of the nineteenth century, while Scoresby was active, demand for the strong, flexible whalebone for use in whips and suspenders grew steadily, until the 1830s when a shift in corsets and hooped skirts, put the whalebone market under extraordinary strain. In the 1830s alone the amount harvested increased seven-fold while the real price of whalebone per pound almost doubled.[73] In Bristol, in 1836, corset busks stood for the property and prosperity of the Arctic whaling industry. Further, for whalers, it was critical that harpoons should be made of soft iron, like the iron Scoresby stroked at the Bristol British Association meeting. Soft iron would bend rather than break in the whale. The paper that interleaved Scoresby's busks recalled the parchment that marked his iron harpoons, the single thread of unspun silk, the *helko* principle of fast and loose.

Scoresby's demonstration made an impression on the British Association audience, not least Woolwich mathematician, Samuel Hunter Christie; military engineer, Edward Sabine; and naval officer, James Clark Ross; all of whom were in attendance presenting on their own magnetic researches. Mastery of the magnetic needle was key to the whaling captain's power. When Ahab demonstrated the compass he had forged, he called out to his audience of awed seamen 'Look ye, for yourselves, if Ahab be not lord of the level loadstone! The sun is East, and that compass swears it!'[74] In Ahab's pride Melville shows what was salient in Scoresby's mechanical theatre. In his denouement, Scoresby claimed that, 'Professor Christie… had even stated his conviction… that by this [instrument], the magnetic effect of the solar rays, and the change caused by the passing of a cloud, would become perceptible.'[75] This was Dening's 'delicate, dangerous moment', where the actor confronts the audience, and the audience, here, Christie, Sabine, and Ross, the embodiment of the fiscal military state, participated in Scoresby's creative process of representing his social and cosmological relations.[76] Three years on, Scoresby would still recall Christie's response with hot shame.[77]

Christie was the British Association and Royal Society's designated expert on magnetism, with over sixteen years of experiment and prestigious publications, specialising in the magnetic effect of solar rays. His comment that '[h]e did not mean to convey to Mr Scoresby the impression that he had tried any experiments upon the magnetic effects of the solar ray, or of clouds being interposed' reveals the scorching sarcasm of his mock praise. In front of the learned audience, Christie made clear that Scoresby was not to quote him, that theirs was a different science, and others before had observed what Scoresby only manufactured. In so saying the mathematician took from Scoresby the property of his skill, rendering the whaler and the dramatic power of his layered busks, his 'magnetic combination', mere show. Christie was a principal figure in the campaign to establish a network of magnetic observatories. Described by Sabine as 'a great combination, embracing the whole globe in its field of action, and all civilised nations as co-operators',[78] a magnetic combination in the social, political sense. Since his earliest researches however, Christie had taken care to distinguish his work from those of men like Scoresby, noting that his was 'more of a philosophical nature', pertaining to the influence of the sun.[79] If Scoresby's cosmology was labour and the lode-stone, Christie was a sun-worshipper. In reviewing the work of peers, Christie would strike out any mention of the heat employed in and generated through working metal.[80] His interest in the influence of heat on magnetism was itself a discrimination of status. The heat of labour was too plebeian, and to be excluded. So, according to Christie, was Scoresby's mechanical theatre, that through beating and stroking brought iron into submission.

In July 1837, the year following Scoresby's Bristol demonstration, Christie, Ross, and Sabine, along with evangelicals Beaufort and Jervis, were appointed to an Admiralty Committee to reform the state of compasses on naval vessels, with Christie in charge of research into compass needles. Remembering Scoresby's Bristol demonstration, and 'very desirous to avail themselves of any improvements which [Scoresby] may have been able to arrive at', the committee wrote to solicit the former whaler.[81] In particular, it was the 'aggregate power' of Scoresby's 'combinations', 'considered to possess greater energy than any other', to which they were drawn.[82] For this trial Scoresby was required to provide two needles that would illustrate his proposed improvements.[83] These needles were then to be submitted to a comparative examination with others,[84] manufactured under Christie's supervision.[85] On Christie's specification, the trial was to adopt 'the Balance of Torsion for the determination of the force of different needles.'[86] The balance design was explicitly based on that developed by *polytechnicien* Charles Augustin de Coulomb, in his efforts to turn magnetic compass navigation into a precision science, on behalf of the French government and Paris *Académie des Sciences*.[87] Coulomb's work on torsion carried him from military engineer to astronomer at the Paris Observatory, where he curated his exquisite balance. It was in Coulomb's famous

researches that Christie, the ambitious Military Academy professor, saw his practice and purpose.[88]

Scoresby's biographers have noted that, at this stage, 'there was no unpleasantness, nor unwillingness to give freely... just Scoresby's request to personally demonstrate his patented laminated needle.[89] But his private correspondence, in the same months, indicates otherwise. Scoresby suggested that the hostility of Sabine and jealousy of Christie had led the 1837 British Association committee to refuse him a grant for support to work on his compound magnetic needle.[90] Unsurprisingly, when Ross wrote to Sabine early the following year, regarding the upcoming compass-needle trial, he anticipated trouble between Scoresby and Christie.[91] Eight days after Ross's warning, they assembled in the Admiralty Library,[92] and the committee pulled Scoresby, and his needles, apart in a heated contest of disputed ownership. With the needles disassembled, the Committee saw no novelty in Scoresby's claims and produced extant compasses to show that the principle of construction he proposed had long been in use. For Scoresby, however, the novelty and his claim to priority and property lay precisely in the assemblage, or rather 'the combination' and the temper of his laminated needles: '[therein] consists the value of the discovery'.[93] Scoresby immediately wrote to Ross on the surprise, pain, and grief the meeting caused him, and then another long missive a day later, stressing the originality of his principle of construction, the combination of layered tempered steel, and his humiliation at the 1836 Bristol meeting by Christie.

> …in pursuing what I think just to myself…of this I am well convinced, that had it not so happened, unfortunately, that myself and one of your members had been pulling too close together in the same narrow channel, our oars would not have knocked together. This is bad management, - one must go ahead![94]

Over fifteen years on from the formative dispute with his father, Scoresby recalled the 'unhappy strait'. On the principle of 'fast fish loose fish', the attachment was priority, 'a mast, an oar… or a strand of cobweb it is all the same'. For oars to clash in the same strait was to cross wires over priority ownership of a whale.

If Scoresby spoke in cetacean citations, the committee heard a petulant and unruly artisan. While Sabine gave the damning verdict 'the artist has failed in the steel',[95] Christie warned that '[p]retensions are advanced which would tend to shackle the Committee'. Far from poor work, he was concerned with the valuable property claim of the workman, and, as at the Bristol meeting, used precedent to attack Scoresby's mastery over process.[96] When Scoresby stood in the Admiralty library and saw oars knock, felt the narrowness of the ice closing in, he saw and felt himself as a whaler in and defined by conversation with other whalers. When Sabine and Christie responded in terms of labour and property, they saw themselves as regulators, in dialogue only with one another.[97]

Humiliated by his patrons, let down by his combinations, finding the Admiralty would not recognise his priority, Scoresby madly sought property in iron. Following his dismissal by the committee, Scoresby obsessed over its qualities, scrutinising pieces still hot from the foundry, and observing the changes with hardening or tempering. Each piece was marked by wrapping tightly in parchment paper, bound in loops of cord. Contest over the ownership of skill pushed the whaler turned magnetist to more profound forms of embodiment. As he had done in whaling since the dispute with his father back in 1812, Scoresby marked property with iron, inscriptions, parchment, and rope.

Drawing on his observations Scoresby built needles of extraordinary power, one he even named 'my Goliath',[98] and toured the country giving lectures where these laminated needles, busks combined in layers connected to an apparatus of hooks and pulleys, would lift phenomenal weights. Sketches on the back of Scoresby's lecture notes show the hooks for his magnetical apparatus, identical to those that once hoisted blubber onto

the *Resolution*.[99] Just as with the hooks of the flensing system, ton by ton, he secured his claim. These lectures set out Scoresby's magnetic cosmology of 'the law, or alteration of power, by combination',[100] which argued 'the force of magnetics when combined in magnetical order is much greater than the sum of individual forces when separate.'[101] Power forged through this union formed the basis for his famous *Magnetical Investigations* in two parts, the first (1839) introducing his grand theory of 'the law of combination', [102] while every chapter of the second (1842) was devoted to its representation. This law, argued Scoresby, explained the weakness of individual or opposed magnets, and the leviathan power of magnets acting in parallel, where interleaved with thin slips of paper.[103] The choice of terms was peculiarly eloquent. To hear the phrase 'the law of combination' in earlier nineteenth-century Britain was to hear a reference to the Combination laws, and in Scoresby's framing, his law was a loud call for reform directed at both state and unions.

Conclusion

> …if I shall touch that workman's arm with some ethereal light; if I shall spread a rainbow over his disastrous set of sun; then against all mortal critics bear me out in it.
> *Moby-Dick*

In *Moby-Dick*, Ishmael describes Queequeg's skin as parchment,[104] and, like Melville's Maori inspiration, Te Pehi Kupe, covered in tattoos, a complete cosmology made of skin and ink. This paper has been concerned with how materials, ink, skin, parchment, iron, can define property relations, not simply because they carry marks, but because of their own peculiar properties. Juniper Ellis has shown how Te Pehi Kupe's *moko* has a famous but distorted legacy. The *moko* drawn by the South Sea Island King and reproduced in Craik's *New Zealanders* (Figure 2), was a crucial case study for Claude Levi-Strauss's seminal work *Structural Anthropology* published in 1958, and then used as the cover illustration for the first English translation in 1963 by Claire Jacobson and Brooke Grundfest Schoepf.[105] The significance of *moko* is in the interplay between skin and ink, the relation between materials, but the relation between materials is very specifically a human and an individual one. It is Te Pehi Kupe's skin that makes the pattern in the original drawing as it appeared in Craik's *New Zealanders*.[106] Levi-Strauss used Te Pehi Kupe's *moko*, from Craik, anonymously. But alienated from the individual, from Te Pehi Kupe's skin, then ink and skin cease to interplay. Ink alone does not embody the social, physical, and cosmological relations of this highly complex system. Without the relation between skin and ink there is no *moko*.[107]

In the Levi-Strauss cover design, the eyes are white, the ink gold, and the space in between which was skin, now an extension of the cover. The skin no longer forms the pattern, rather it has become background to the mask of the gold. This is the logical extension of Levi-Strauss's claims and the final alienation of Te Pehi Kupe's *moko*, no longer his social, physical, and cosmological relations, no longer a map of true places, but a mask. [108]

Te Pehi Kupe said of his own *moko* (Figure 2) that a "Europee man write with pen his name, Te Pehi's is here" and pointed to his forehead,[109] to the brow lines that invoke a bent bow and the god of the rainbow.[110] The evangelical Scoresby raised his children exclusively on the *Old Testament*;[111] his was an *Old Testament* cosmology. When he tempered his compass needles, he put the rainbow, his cosmology, the covenant between man and god, into the iron. As with skin and ink, so with iron: how iron mattered depended on a very specific and indispensible set of human relations, the property of iron depended on the particular combination. In *The Other Face of the Moon,* Levi-Strauss argued that the outsider is better placed to understand the social order and patterns of behaviour under observation. Others, such as Dening, have shown this to

have the quality of a mirror, where the social order seen by the observer says more about them than it does those observed. Only by looking at Scoresby's iron did I appreciate the evangelism of the Admiralty, and looking at the Admiralty's needles do I see the labour economy of Scoresby. Melville's *Moby-Dick* is a master study of such mirroring. To take two examples, Ahab suffers the 'Guinea-coast slavery of solitary command', while the harpooners Queequeg and the Wampanoag Indian, Tashtego, 'filled their bellies like East Indiamen ships all day loading with Spices'. Through the reflection of socio-economic relations, we learn about the crew of the *Pequod*, and to attend to the reflective surface itself. Rather than take the inherent contradiction of objective representation as a given, the materials of this study have been treated as a mirror reflecting and revealing the power relations projected onto them. They themselves form locales, selected sites which realise lived tensions by bringing them into focus. Materials here are turned into the very stuff of the historian's survey, just as they were for Scoresby and the Committee: materials are the guide to 'true places'.

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[111] W. Scoresby, *Memorial of an affectionate and dutiful son* (James Nisbet & Co, London, 1837), p.32.