

The Struggle for Maritime Empiricism: Optics and Mirage in the Arctic.

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But O my soul! Avoid that wondrous maze
Where Reason, lost in endless error strays!
(Falconer, *The Shipwreck* 1870, p. 124)

The sea was at different times, and for different people, both an empirical laboratory and a 'wondrous maze'. The triumph of empiricism is emphasized in Jurgen Osterhammel's account of the long eighteenth century. From about 1670 onwards, Osterhammel argues "an empiricist approach to knowledge is all but unchallenged: the authority of the classical sources and the modern *erudits* is to be tested against the yardstick of experience" (2018:181).

Sharp-eyed observation

Osterhammel, who is keen to stress the deep history of "sharp-eyed observ[ation]" mentions Dampier but might well have also included Richard Walter who, presenting his 1748 account of Anson's voyage, introduces a complexity into the consideration of the relation between observation and the "wondrous maze". Walter would have provided a more complex and more interesting approach to the question which Osterhammel forecloses too easily. For Walter, observation itself ('actual seeing') was likely to prove insufficient and might result in the internalisation of deceptive appearances. "I cannot...but lament" he wrote "how very imperfect many of our accounts of distant countries are rendered by the relators being unskilled in drawing" (1974: lxi). Experience was likely to be enhanced if supported by "drawing". Drawing, Walter argued was valuable because of "the strength and distinguishing power it adds to some of our faculties" which would make the geography of the globe "much correcter" (1974: lxii).

"Those who are accustomed to draw objects, observe them with more distinctness, than others who are not habituated to the practice" Walter

continued(1974, p.lxii). The objectified and permanent record provided by drawing helped rectify a habitual deficiency in the process of ordinary vision: “when we view any object...our attention or memory is scarcely at any time so strong as to enable us, when we have turned our eyes away from it, to recollect exactly every part it consisted of, and to recall all the circumstances of its appearance”. By contrast “he that is accustomed to draw what he sees, is at the same time accustomed to rectify this attention; for by confronting his ideas copied on the paper, with the object he intends to represent, he finds out what circumstance has deceived him in its appearance; and hence he at length acquires the habit of observing much more at one view, and retains what he sees with more correctness than he could ever have done, without his practice and proficiency in drawing” (1974: lxii) **[Place Fig. 1 here]**.

In Osterhammel there is nevertheless a troubling triumphalism reminiscent of Bernard Smith’s much earlier claim that ‘art’ acted in uncomplicated ways “in the service of science and travel” (Smith 1992:1). Bernard Smith’s celebrated account of European voyaging, and looking, in the South Pacific locates an empirical revolution at the heart of the 2nd Cook voyage. The chief hero of Smith’s story of the triumph of experience is the artist William Hodges who is transformed from the neo-classical pupil of Richard Wilson into a plein air experimenter. Air - the atmosphere of the south Pacific – emerges as an actor of considerable importance (recall that Joseph Priestley was a potential member of Cook’s crew), together with what we might think of as the *culture of the sea*, in this case the practical and scientific skills of those on deck, from ordinary seamen to the astronomer James Wales.

Under the watchful gaze of William Wales, the astronomer and meteorologist on the *Resolution*, Smith suggests, there was a powerful culture of empirical observation that created a common ground for scientists, artists and seamen. Smith notes that “a close study of effects of light upon the colour of the sea was of great practical importance” being central to the forecasting of weather changes. He quotes J. R. Forster (who “combined a passion for empirical observation with a delight in general philosophical speculation”, 1985:55) as remarking that “often you are deceived by the situation of the sky and clouds” and that “A judicious eye, conducted by long experience, can alone distinguish

properly in these cases” (1985:56). In addition to this pervasive concern with the observation of clouds and the colour of seawater, Hodges was also directly influenced by his interactions with crew who were skilled in charting. Henry Roberts, Joseph Gilbert and Isaac Smith, like Hodges himself, all produced coastal profiles and harbour views, and it is clear that Hodges “was influenced by the naval regard for strict accuracy in drawing the outlines of hills and coasts” (1985:56). This shared experimental and observational culture of the sea leads Smith to the conclusion that “we may observe naval practice exerting an influence upon an artist trained in neo-classical traditions of landscape painting” (1985:56).

However, Smith’s basic narrative (involving what we might think of as the triumph of maritime empiricism) is one that can be played at many historical junctures. The jolt that the experience of “reality” gave to expectation and established schemata is repeated throughout history. Experience, especially visual experience, has long been acclaimed as a force that liberates humans from convention. The triumph of experience has been given various chronologies: Anthony Grafton begins his bracing account of the collision between ‘new worlds’ and ancient texts with Jose de Acosta’s celebrated account of travelling across the Equator: “Having read what poets and philosophers write of the Torrid Zone, I persuaded myself that when I came to the Equator, I would not be able to endure the violent heat, but it turned out otherwise. For when I passed [the Equator] ...I felt so cold that I was forced to go into the sun to warm myself” (cited in Grafton 1992:198).

The impact of the discovery of a formerly un-imagined continent and of maritime experience on knowledge practices found its perfect monument in Francis Bacon’s *Great Instauration* of 1620, embodied in its wonderful frontispiece depicting the ship of knowledge sailing through the Pillars of Hercules, ‘the ancient limits of navigation and knowledge’ (cited by Grafton 1992:198) and Bacon’s declaration that ‘it would be disgraceful if, while the regions of the material globe...have been in our time laid widely open and revealed, the intellectual globe should remain shut up within the narrow limit of old discoveries’ (cited by Grafton 1992:198).

The autoptic imagination

Grafton sets up Acosta's narrative and Bacon's celebration as emblematic of the simplistic narrative he then critiques, advancing instead the conclusion that knowledge advanced "as much from contradictions and tensions within texts as from their confrontation with external novelties" (1992:6). This scepticism is developed with great theoretical sophistication by Anthony Pagden in a history of the possibility of eye-witnessing that he labels "the autoptic imagination". Pagden's central claim is that the "real" and "visible" don't magically materialise as alternatives to what Hobbes called "Aristotelity" (ie the wisdom of the ancients that Bacon so decried), but have to be culturally and imaginatively willed into existence as rival sources of authority. And the specific relevance of Pagden to the argument about mirages advanced here is that he shows in marvellous detail how the visible world – appealed to by those distrustful of conventional knowledge – turned into a very perilous wondrous maze.

Pagden cites de Certeau: "Only the appeal to the senses" (here de Certeau is commenting on Montaigne) "and a link to the body...seem capable of bringing closer, and guaranteeing, in a single but indisputable fashion, the real that is lost in language". But Pagden then goes on to demonstrate that the senses, and experience, do not exist in some pre-authorised form, already liberated from the canon of knowledge towards which it was felt to be antagonistic. Pagden argues that "not only did the canon determine what could be said with any degree of conviction within any given community, it also established what the objects of inquiry be in the first instance. It determined, that is, what *could* be seen" (1993:54). Pagden illustrates this claim through reference to the great difficulty that Columbus had in accepting that he had not in fact discovered Cathay via a miraculously short route.

Observation of externalities could not in itself make a claim to authority. It had to work within the expectations of the time. Hence the "observers of the American world, whose authority rested solely on their status as observers had, there fore, to raise themselves as authors ...to a level which, if it was not directly comparable with that occupied by the either the Church Fathers or the Bible,

was, nevertheless, as distinctive and authoritative as the scientific works of antiquity" (1993:56).

Pagden develops his critique of what we might term "ready-made empiricism" through a consideration of the epochal debate between Las Casas and Oviedo concerning the "rights of the Indians". Both men, Pagden notes were "aware of how frail all claims to authority could be when made by a single voice" (1993:58). Indeed as Las Casas wrote "to give substance...to the greatness of the Indies...one would need all the eloquence of Demosthenes and the hand of Cicero" (1993:61).

Las Casas and Oviedo were caught within an intractable paradox: they had to separate their new modes of truth claims (foregrounding first person experience) from romances whose central feature was their claim to be true because they in some fundamental sense lacked an author. Romances were presented as "found" texts that had been "merely edited, translated, and made accessible to the world which their readers inhabit" (1993:63). They deployed in other words, the techniques of early ethnographic reportage in which the role of the anthropologist-author was to translate and edit a "found" narrative in some sense gifted by the people who were being studied. Pagden quotes Starobinski on Montesquieu's *Persian Letters*: "It is to give to the work...the prestige of an origin which is entirely independent of any literary tradition; it is to deny [to the text] ... every imaginary provenance" (cited by Pagden 1993:64). As Pagden notes "the only kind of authorial voice with which the reader is confronted is one which immediately seeks to erase itself" (1993:64).

Real but not true

In the case of mirage (regardless of the disputed earlier history of the term) as the result of a kind of nominative determinism following Monge's publicization of the term (together with an optical theory) we find an enormous efflorescence of reference to the phenomenon post 1800, as though a dam had burst, inundating the early 19th century reader with accounts of what had previously – because it was un-nameable - been difficult to see.

Prior to Monge's explanation of the relationship of mirage to refraction, optical phenomena were especially mysterious. Byron's Journal of his 1764-1766 Circumnavigation provides a memorable example. Tasked to search for Pepys' Island and the Southern Continent, Byron is celebrated for a voyage that made no discoveries of any importance. On 7th November Byron "was then walking the Quarter Deck when all the People upon the Forecastle called out at once Land right ahead" (1964:29). Byron then looks under the Foresail and from the Lee Bow "&saw / it to all appearance as plain as ever I saw Land in my life" (1964:30). Looking like an island with "two very scraggy Hammocks upon it", it quickly assumes the appearance of something more encompassing. Byron changes tack but "all this time the appearance of the Land did not alter in the least, the Hills looked very as they generally do at some distance in dark rainy weather, & many of the People said they saw the Sea break upon the Sandy Beaches." After another hour "what we took for Land at all once disappeared to our great astonishment, & certainly must have been nothing but a Fog Bank. Tho' I have been at Sea now 27 Years & never saw such a Deception before" (1964:30). Byron concludes his account by recalling that some of his crew had (on a different ship) seen "an Island between / the West End of Ireland and Newfoundland, & even distinguishing the Trees upon it, & which since has never been heard of tho' Ships have been sent out on purpose to look for it." (1964:30).

Optically 'real', but not 'true', mirages disordered experience, tricked their beholders, and provided proof that sense experience was not to be trusted. No amount of corrective drawing (following Walter) would dispel the sense experience registering the distorting effect of refraction. Furthermore, mirages brought different forms of experience into conflict. This was demonstrated by the tenacity of beliefs - based on visual experience - of beliefs concerning the island that became known as St Brandan, or Borondon.

Problems with sense experience

This mirage island was the subject of an anonymous review of David Brewster's *Letters on Natural Magic*, probably by the liturgist Daniel Rock, in the Catholic periodical *The Dublin Review* in 1837. Rock's concern was to defend the

mysteries of religion from empirical attack by highlighting the unreliability of sense experience. To this end he marshalled evidence of the persuasive nature of mirages as proof that the senses “are utterly incompetent and inadmissible as faithful guides in any investigation on the mysteries of religion and objects of divine faith” (Rock 1837:548). Mirages, together with other mysteries were conclusive evidence of the ‘fallacious evidence of the senses’ and the “discordance between our perceptions and their causes” (1837:541).

Rock’s target was Brewster and the tradition he embodied. As visual puzzles and zones of uncertainty, mirages were important to a philosophical tradition for which the eye was granted a privileged place as the arbiter of knowledge.¹ The eye was central to David Brewster’s understanding of the world, the optic nerve being the means by which ‘the mind peruses the handwriting of nature’ Brewster, cited by Morus 2012:40). His *Letters on Natural Magic* of 1832 sought to demonstrate that ‘susceptibility to deception was built into the mechanism of the eye’ (Morus 2012:39) and that the scrutiny of this fallibility would deepen our understanding of these mechanisms.

Rock expounds his contrasting lesson in the misplaced faith that we invest in our senses through an account of St. Brandan, which has persistently ‘haunted the imagination of the inhabitants of the Canaries’. Canary Islanders imagined that they saw a mountainous island, ninety leagues in length lying to the west. It appears in Martin Behaim’s globe of 1492 (the Erdapfel, now in the German National Museum in Nuremberg). Most maps at the time of Columbus, Rock notes, placed St. Brandan ‘about two hundred leagues west of the Canaries’, but it had a much deeper history, being known to the ancients and referred to by Ptolemy as Aprositus (‘inaccessible’). For Rock it is important that this is no fleeting deceit but a systematic deception and persistent of the senses of the mass of the populace over the centuries, suggesting a profound inability by (ordinary) humans to determine, on their own, what is true or false.

Rock is keen to stress that the island was ‘repeatedly seen’, by many observers at the same time, and always in the same place ‘and in the same form’. Fernando de Troya and Fernando Alvarez led an expedition in pursuit of it in 1526 and of course found nothing. By this stage, however, such was the power of

¹ See Rorty (1980), and Morus (2012:38)

the phantasm's 'secret enchantment for all who beheld it, that the public preferred doubting the good conduct of the explorers rather than their own senses' (cited by Rock 1837:526). Subsequently one Alonzo de Espinosa, Governor of Ferro in the Canaries, filed a report in which more than a hundred witnesses testified to their sighting of the island. This, together with other accumulated proofs prompted another expedition, commanded by Fernando de Villalobos in 1570, which departed from Palma. It too, failed to locate the mirage: 'St. Borondon seemed disposed only to tantalize the world with distant and serene glimpses of [an] ideal paradise...but to hide it completely from the view of all who diligently sought it'. A further expedition was launched in search of the Canary Islanders' "favourite chimera" (1837:527). In 1605 Gaspar Perez de Acosta led a voyage which was also unsuccessful. A final fourth expedition led by Don Gaspar Dominguez in 1721 was provoked by the 'lemons...and green branches of trees' that washed up on the shores of Gomara and Ferro and that were assumed to have originated in the 'enchanted groves of San Borondon' (Rock 1837:527).

Because the public did not listen to wise men of science (just as they did not listen to those who understood recondite matters of religion, in Rock's view) St. Brandan refused to disappear. It appeared as one of the Canary Islands in a French map of 1704 and in another in 1755 where it was placed five degrees west of Ferro. It became indestructible: "It was in vain that repeated voyages and investigations proved its non-existence" and the public "to defend their favourite chimera" sought refuge in the supernatural. It became muddled with the Seven Cities where seven bishops had taken refuge from the Moors, with the abode of the Portuguese King Sebastian, or that of the Spanish Roderick, also fleeing the Moors. Some thought it a 'terrestrial paradise', a place 'made at times apparent to the eyes, but invisible to the search of mortals' (1837:528).²

The Croker Mountains

² Washington Irving provides a very similar account, based on the same sources (1876: 876-881). Irving concludes by agreeing with father Feyjoo that the cause of all these sightings was 'certain atmospherical deceptions, like that of the Fata Morgana' (1876: 881).

What Osterhammel terms the “yardstick of experience” was not in itself necessarily helpful, especially when confronted with mirage. Mirage’s ability to deceive features cruelly in the Arctic career of Captain John Ross. Dionysius Lardner’s 1831 *Cabinet Cyclopaedia of The History of Maritime and Inland Discovery* expressed an especially harsh judgment. Conceding that Ross was an “experienced commander”, Lardner judges him to “have been deficient in the confident hope and ardour which are requisite qualifications in those who conduct voyages of discovery”. Noting several examples illustrative of Ross’ “little interest in the solution of geographical problems”, and the manner in which Ross “interpose[ed] his private belief where enquiry ought to have decided the question”. This private belief took the form of his “single authority” (1831:197) which Lardner contrasts with the “amazement of all his officers” (1831:198). Lardner thus suggests that geographical problems were most likely to be solved by the consensus of the on-board community.

Lardner progresses to the mistake that would destroy Ross’ career: the sighting of “Croker Mountains”. On 29th August 1818, Ross’ ships entered a 50 mile inlet on the south-western shore of Baffin’s Bay but 30 miles further Ross suddenly decided to return: “To the imaginary range of hills which thus seemed to prevent his progress to the west, he gave the name of *Croker’s Mountains*” (1831:198). The aquatint in Ross’ opulent 1819 account of his voyage is based on a drawing made by Ross himself, and shows the huge snow-covered mass of the Croker Mountains towering above the lower profile of Cape Rosomond **[Place Fig. 2 here]**.

Lardner’s faith in “enquiry” seems inadequate and simplistic when set against the complexity of experience and data that John Ross himself presented in his own account of the voyage. Both opacity and clarity at high latitudes produced bewildering effects: “In the absence of ... fogs, we had sometimes the atmosphere most beautifully clear; the objects on the horizon were often most wonderfully raised by the power of refraction, while others, at a short distance from them, were as much sunk” (Ross 1819:143).

Ross brilliantly describes an optical world in which the eyes can no longer be relied on as conduits of reliable data: “... objects were continually varying in

shape; the ice had sometimes the appearance of an immense wall on the horizon, with here and there a space resembling a breach in it; icebergs, and even small pieces of ice, had often the appearance of trees, and while, on one side, we had the resemblance of a forest near us, the pieces of ice, on the other side, were so greatly lengthened, as to look like long low islands" (1819:143). The extraordinary illustrations in Ross' account also show how icebergs assumed fantastical seemingly man-made architectural shapes **[Place Fig. 3 here]**

The effects of "looming" were prodigious, with Ross reporting seeing land at a distance of 150 miles, far beyond the usual 12 mile limit of the horizon. Even more strikingly, land forms were highly mobile and subject to rapid shape-shifting: objects would shift their altitude within "a few minutes". The high rock off Cape Dudley Digges, for instance, increased its altitude by three degrees within an hour and "in the course of the next half hour it decreased to the appearance of a speck on that water and soon after it became like a long low island, in which state it remained for some hours, when it resumed its natural shape" (1819:144).

Ross powerfully conjures a world so complex and mobile that conventional notions of "experience" seem inadequate. The "Acosta model" makes no sense for the deck of the ship has become not a place of revelation but a place of mystification and deception. Sense experience complicates rather than clarifies matters.

Of course one should also acknowledge the possibility that Ross exaggerates the confusion in this environment because he was about to make his fatal error; naming a mirage after the Secretary to the Admiralty.³ In the lead up to the moment of deception by the apparent appearance of Croker Mountains he stresses how "even after all hopes of a passage were given up" his anxiety "determined me to persevere as I did, notwithstanding there was no current, a material decrease in the temperature of the sea, and no driftwood, or other indication of a passage, until I actually saw a barrier of high mountains, and the continuity of ice, which put the question at rest" (1819:183).

³ "...the mountains, which occupied the centre in a north and south direction, were named Croker's Mountains, after the Secretary to the Admiralty".(Ross, 1819:174-75).

A century later the American geologist William Herbert Hobbs would offer a much kinder verdict on “explorers” (including Ross) who have “repeatedly and quite unjustly been brought into discredit by later ship captains, who have arrived off these shores when sea-ice conditions were more favourable and have permitted of nearer approach, or when atmospheric conditions were less deceptive” (1937:233). Hobbs suggested that the Croker Mountains, which appeared to Ross to be about thirty miles distant in Lancaster Sound, were in all probability “the snow-covered heights of North Somerset Island fully two hundred geographical miles distant” (1937:233). For Hobbs “Conditions of Exceptional Visibility” describe conditions for the production of superior mirages or ‘looming’ which allow objects to be seen at much greater distance. He notes that at sea it is generally the case that an atoll with an elevation of 12-15 feet can be seen at a distance of about twelve miles. In high latitudes it is sometimes possible “to see on certain days complete panorama[s] of glaciers far beyond the normal horizon” (1937:230). Hobbs implies that errors of the kind associated with Ross are not the result of faulty observation: rather the rigorous observation of what is real but not true may be at the heart of the problem.

“The reality of fairy descriptions”

Two decades after Monge’s optical theory of refraction, William Scoresby provides a very different understanding of mirages to that demonstrated by Byron and Ross. Born south of Whitby, Scoresby made his first Arctic journey with his father at the age of eleven. Throughout his life Scoresby was associated with the British Association for the Advancement of Science. He studied chemistry at Edinburgh and his publications provide ample evidence of his experimental and empirical interests.

In a 1820 publication, recounting earlier whaling voyages (Scoresby is quoted as an authority on Cetology in *Moby Dick*), Scoresby narrates his experiences on the 16th July, 1814 sailing past Charles Island, Spitzbergen (Prins Karls Forland) high in the Arctic Ocean. He memorably described what appeared to be a mountain, a surprising one for he had never seen it before. More astonishing, however, was a ‘prodigious and perfect arch’. The mirage then

changed: 'the mountains along the whole coast, assumed the most fantastic forms; the appearance of castles with lofty spires, towers and battlements, would in a few minutes, be converted into a vast arch or romantic bridge'. Scoresby is clearly astonished: 'these varied and sometimes beautiful metamorphoses, naturally suggested the reality of fairy descriptions', but he insists upon the objectivity of these visions. They were 'uncommon phantasms' but Scoresby stresses their objectivity: even when examined with 'a powerful telescope' the mirages 'seemed to possess every possible stability' (1820, vol 1:386). Scoresby's protestations notwithstanding, his elaborate descriptions draw our attention to the manner in which the beholder's imagination fills in the detail provided by the mirage template: the empirical understanding of mirages are not compatible with his descriptions of spires, towers, and battlements. What he sees are cues and prompts that invite his imagination to recast them as familiar non-Artic phenomena.

Scoresby's 1822 voyage was also primarily focused on whaling, and as he puts it in his Introduction "Discovery was an object, therefore, that could only be pursued subserviently to this" (1823:xv). This voyage, whose narrative was published the following year contain many remarkable illustrations of mirages and make clear that Scoresby's rationalist resolve had hardened. Scoresby refers throughout his 1823 account to mirages as "optical phenomena of unequal refraction" (1823:163) and this later text is strikingly less inclined to express wonder at the effects of mirage.

His scientific eye is rebuffed ("the whole coast was found to be so disfigured by refraction, that I could not recognise a single mountain or headland" 1823:143) but never fully bamboozled. He is keen to demonstrate his knowledge of the physics of 'looming' ("Inverted images of two ships, occasionally double, were seen in the air, which, I imagine, were at least ten miles beyond the limit of direct vision" 1823:144). Other ships had hulls as tall as castles. But Scoresby seems largely in control of this magical and evanescent seascape. "No sooner had one appearance been examined and sketched, than it changed, and often exhibited the most uncouth proportions." 1823:144).

Scoresby concedes the "uncouth" nature of mirage but this is quickly supplanted by a different aesthetic judgment, one which again suggests a

pleasurable control, a serene spectatorship of a phenomenon that pushes against but does not exceed his rationalist control: “The distant ice partook also of the same influence, and presented very extraordinary and often beautiful resemblances to magnificent architectural structures.” 1823:145). Later Scoresby details the manner in which parts of the horizon “were reared into various architectural figures of extraordinary elevation...in resemblance of an innumerable collection of spires and pinnacles...” (1823:164). This scene is echoed in one of several plates showing several tall-masted vessels in front of a remarkable city-horizon (figure 2). Here, as we will later see with Alexander Badlam’s account of Alaskan mirages, the illustration seems to intensify what is weakly and metaphorically stated in the text. Scoresby’s “resemblance of spires and pinnacles” is transformed in W. H. Lizars’ image into an actual mass of spires and pinnacles recalling the dense and jumbled water frontage of Venice **[Place Fig. 4 here]**.

On one occasion, he notes, “the phenomenon was so universal, that the space in which the ship navigated seemed to be one vast circular area, bounded by a mural precipice, of great elevation, of basaltic ice” (1823:163). A row of what looked like basaltic columns exhibited “specks and patches of ice [that] had sometimes so much of the character and appearance of land, that one of my principal officers, who was familiar with the general phenomena, was deceived by it” (1823:164). Others were fooled, but not Scoresby.

The ‘looming’ mirages for which Scoresby became best known involved ships of the Flying Dutchman variety. Under certain circumstances, he notes, ‘all objects seen on the horizon seem to be lifted [and] extended in height above their natural dimensions.’ Often appearing to be connected to the horizon by ‘fibrous’ or ‘columnar’ extensions, (Scoresby 1820:384; see also Anon 1880) these ships were elevated and also often inverted. Scoresby provides a memorable description of an inverted image of his father’s ship *The Fame*. He wrote of a “distinct inverted image of a ship in the clear sky, over the middle of the large bay” (1823:189) and “the perfection of the image, and the great distance of the vessel that it represented” (1823:189-90, calculating that *The Fame* was at the time seventeen miles over the horizon **[Place Fig. 5 here]**). We

will return to this image, and the information it conveys, at the end of this chapter.

“A sinking weight”

Bridging the long Enlightenment, and the chronology traced in this chapter, a ghostly ship from 1647 resurfaced in 1832. Appearing first as a Providential consolation, the ship had first appeared in Cotton Mather’s *Ecclesiastical History of New England*, only to reappear in the early 19th century via a letter from the Rev James Pierpoint, printed in *Raphael’s Prophetic Messenger* of 1832.

Titled “The Apparition of a Ship in the Air” the letter details the loss of a ship of about 150 tons built at Rhode Island. The “godly” of Newhaven, from where many of the passengers had originated, hoped that “the Lord would, if it was his pleasure let them hear what he had done with their dear friends”. Their prayers were answered the following June after a terrible thunderstorm by the sight of the missing ship in the air above the town’s harbour. “Many were drawn to behold this great work of God” before the ship “vanished into a smoking cloud” and they concluded that this was “the mould” of the missing ship and “this was her tragic end” (Pierpoint 1832:55).

The Providentialist consolation of Cotton Mather’s account is transformed a few years later by the *Prophetic Messenger’s* author, Charlton Wright, into a haunting gothic allegory which takes us very far from Scoresby’s clear vision and incarnates mirage as a vehicle for the return of the undead. In *Tales of the Horrible, Or, The Book of Spirits*, published in 1837, the apparition is incarnated as the soon to be popular Flying Dutchman. Noting that the story had become popular in “Dramatic form”, the story, titled “The Phantom Ship; or, the Flying Dutchman”, narrates the appearance during a storm in Table Bay of a Dutch vessel captained by Vanderdecken, that had last been seen seventy years previously. The Flying Dutchman sends out a skip to deliver letters back home (their ship having “long been kept by foul weather”). These are refused since as a deckhand says “there is sometimes a *sinking weight* in your paper”. Nevertheless one of the crew from the skip left the parcel of letters on the deck, creating a dilemma for as one sailor reports “I have always heard it asserted, that it is

neither safe to accept them voluntarily, nor when they are left to throw them out of the ship” (Wright 1837:56). Fortuitously, a sudden squall arrives, and the cursed letters “were whirled overboard by the wind, like birds of evil omen whirring through air” (Wright 1837:56).

We might be tempted to agree with the 1767 *New Catalogue of Vulgar Errors*’ estimation of sailors: “no persons are so much terrified at the thought of an apparition. Their sea-songs are full of them; they firmly believe their existence, and honest Jack Tar shall be more frightened at the glimmering of the moon upon the tackling of the ship, than he would be if a Frenchman were to place a blunderbuss at his head” (cited by Wright 1880:86). Charlton Wright’s gothic fantasy alerts us to the different genre registers within which mirage operated but we should also be aware of the class dimensions of the new empiricism.

Media and the Geometry of Mirage

Bernard Smith’s faith the progressive ascendancy of “visual representation in the service of science” (1992:1) can be tested through another route: the reconstruction of the optics of mirages through their representation. This is the tactic deployed by W. G. Rees in a careful analysis of the mirage of *The Fame* seen and reported by Scoresby in the Greenland Sea. Rees establishes the procedure for reconstructions that permit the determination of “variations of atmospheric temperature with height” (Rees 1988:325) and concludes on the basis of an illustration attributed to William Scoresby in 1822, that we can reconstruct “a temperature inversion layer at least 80m in height extending upwards from about 40m above sea level. Within this layer the air temperature rose by about 18C” (1988:325).

Rees writes of “Scoresby’s illustration” but in fact relies upon what is indicated in parentheses as “(Scoresby-Jackson 1861, p. 194 and title page)” (1988:325) **[Place Fig. 6 here]**. The first mention of Scoresby directs the reader’s attention to William Scoresby’s own account titled *Journal of a Voyage to the Northern Whale-Fishery* made in 1822 and published in Edinburgh in 1823

which we have already encountered above. However, Rees then relies upon a much later text, R. E. Scoresby-Jackson's 1861 *The Life of William Scoresby*, an annotated edition of Scoresby's memoirs published in London by Scoresby's nephew which features on its title page a vignette depicting a barque in the foreground with a small inverted mirage of a ship on its right. Page 194 in the 1861 edition of Scoresby-Jackson records the "...distinct inverted image of a ship in the clear sky, over the middle the large bay or inlet, the ship itself being entirely beyond the horizon" (Scoresby-Jackson 1861: 194). We have already encountered this description direct from William Scoresby's own text.

The vignette on Scoresby-Jackson's title page has importance for Rees for it bears the promise of unlocking a historic atmospheric temperature profile. The data required for this reconstruction are "the distance to the object of the mirage, the height above sea level of the observer's eye, the heights of two points on the object, and the corresponding angles at which they appear above the horizontal image". Some of this data is gleaned from Scoresby's written narrative (which establishes that the position of the ship – his father's vessel *Fame* – was "nearly thirty miles"). The rest of the data is derived by Rees from his analysis of the image:

"All the other parameters may be deduced geometrically from the illustration, which I assume to have been drawn with reasonable fidelity" (Rees, 1988:325). This might be a reasonable assumption apart from the fact that there is a significantly different image that is historically closer to Scoresby's experience and which we might plausibly conclude can make a much stronger claim to "fidelity". The 1861 title page vignette is clearly a later reworking of the image that appears as "Plate V. Fig. 2 July 24th" opposite page 164 of Scoresby's original 1823 publication which accompanies the original version of the textual narrative cited above through its 1861 iteration (1823: 189-90). This image is engraved by the Edinburgh atelier of William Home Lizars who is now best remembered for his early collaboration with J. J. Audubon on *Birds of America*. It depicts the inverted image of *The Fame* in a much lower position than in the 1861 version and further to the right of the foregrounded barque. The 1823 engraving provides quite different "data" from that provided by the 1861 image

and suggests that the temperature profile that would ultimately be reconstructed from it would also be quite different.

Both Paul Valery and Bernard Smith might suggest that this discrepancy affirms their faith in photography as the only reliable guarantee of objectivity. Smith started his account of the triumph of correct seeing by recalling William Ivins' observation that Einstein's hypothesis about the relation of gravity and light was subsequently verified by photography in 1919. As Smith wrote "it was not until the invention of photography that a means for recording visual phenomena became available which was demonstrably superior to words as testimony of an event" (Smith 1992:1). In this narrative photography is incarnated as the final resolution of a centuries long quest to transcend convention.

A later moment in the progress of autopticism can be found in Paul Valery's strangely neglected 1939 essay "On the Centenary of Photography" which outlines the manner in which the eye of the camera has subsumed claims to empirical truth. He opens with a striking echo of Richard Walter's 18th-century claims about the virtues of drawing and the desirability of training the eye to observe empirically: "Thanks to photography, the eye grew accustomed to anticipate what it should see, and to see it; and it learned not to see non-existent things, which hitherto, it had clearly seen so clearly" (1980:19). The pre-photographic observer of mirages frequently saw non-existent things, frequently elaborating the basic optical effects of mirage into elaborate visions of oriental cities crowded with minarets. Photography could never fully replicate the imaginative breadth of these earlier visions, in whose visualisation lithography was the perfect servant.

For Valery, the camera, like drawing for Walter, introduced a new discipline in seeing, teaching the eye to avoid deception and to acquire appropriate "habits of observing" (1974:lxii). Valery's end point is the powerful conclusion that photography has also transformed our understanding of history in such a manner that whenever we contemplate the question of "historical knowledge" we are confronted with "this simple question: *Could such and such a fact, as it is narrated, have been photographed?* Since History can apprehend only sensible things...everything on which it grounds its affirmations can be broken

down into things witnessed, in moments that were caught in 'quick takes' or could have been caught had a cameraman, some star news photographer, been on hand. *All the rest is literature*" (1985:195).

And yet Valery is keen to stress the limits of this revolution in the optics of objectivity. While on the one hand Philosophy relies on "visual rhetoric" in its assertion of the benefits of optical objectivity ("We speak figuratively of clarity, reflection, speculation, lucidity..."), on the other he stresses (in almost Burkean fashion) the value and necessity of opacity. "What has proved most seductive to thinkers, however, and furnished the theme for their most brilliant variations, are the deceptive properties of certain aspects of light." "What would become of philosophy", Valery asks "if it did not have the means of questioning appearances?" before then pointing to the optical effects of refraction: "Mirages, sticks that break the moment they are immersed in water and miraculously straighten out when they are withdrawn from their bath".

While there is no denying the general trajectory of empiricism's travel, the Osterhammel account of straightforward ascendancy seems overly-simplistic. Empiricism's career often involves two steps forward and one step back and describes an uncertain and often faltering trajectory. Opacity entwined itself around clarity; reason sometimes surrendered to the Wondrous maze.

The 'scientific' response, in which mirages were conjured only so they could be dissolved by reason was on occasion overly-optimistic. As late as 1914, a correspondent in *Scientific American* bemoaned the poor documentation of arctic mirages despite the polar regions being home to unequalled 'remarkable forms of mirage'. The correspondent approvingly notes Scoresby's description of a Fata Morgana off the coast of Greenland at the beginning of the nineteenth century, giving the appearance of 'an extensive ancient city, abounding with the ruins of castles, obelisks, churches and monuments'. 'The whole exhibition', Scoresby continued, was 'a grand and interesting phantasmagoria'. The reports of other travellers were feeble by comparison. 'Awkward circumlocutory descriptions of the phenomena are substituted for their names', these being akin, the correspondent continued, to a traveller returned from the Sahara who reports seeing a 'large, brown quadruped with a hump on its back'. Scott's

expedition took with it *The Antarctic Manual*, an “elaborate book of instructions”, but it contained no mention of optical phenomena. *Scientific American’s* correspondent concludes with praise of Alfred Wegener’s photographs as published in the reports of the Danish Greenland expedition of 1906-08 and the analytic and descriptive promise of the camera (Anon 1914:132).

Photographs purportedly of Arctic mirages, made in 1888 and 1889, would feature in a fascinating episode that suggested that photography was not in any straightforward way a vehicle for better description. One of the photographs, authored by Professor R. G. Willoughby, claimed to be a record of an astonishing mirage in the vicinity of the Muir Glacier in what is now Glacier Bay National Park, Alaska. Retailing at 75 cents a copy they showed a ‘Silent City’ emerging from the glacier. Alexander Badlam, the author of *Wonders of Alaska*, was outraged when he encountered these ‘glacial joke[s]’ in his travels for as he pointed out they depicted – bizarrely – the city of Bristol. Badlam could not help but see ‘a reflection on the intelligence of the average mind when the public is requested to believe that the city of Bristol, England, has been photographed on top of the Muir Glacier’ (Badlam 1890:127). Willoughby is presented as a gullible backwoodsman (he had ‘never seen a locomotive’, for instance) and his superimposition of the city of Bristol in this unlikely Alaskan location is presented by Badlam as wholly risible.

However, it quickly became more bizarre. *The Daily Transcript*, a Nevada City newspaper reported on the adventures of one James O’Dell who had left California to work in a gold mine in Alaska. Being familiar with the ‘Silent City’ he set about trying to see it. In his earlier life prospecting in California, he perfected an almost magical device, worthy of the *Arabian Nights*, that gave forewarning of the approach of strangers. This involved placing a ‘few pounds’ of quicksilver (mercury) into a gold prospecting pan and then peering into it with a magnifying glass. ‘In this way we could detect anything that moved on any road or in any place for miles around. The face of the country and all upon it was first reflected upon the heavens or upper strata of air, and thence upon the pan of quicksilver’ (1890:131). O’Dell and a companion cruised around in front of the Muir Glacier for a day or two hoping to see the mirage, without success. They then decided to try divination by quicksilver and were immediately rewarded with an image of

what appeared to be a large ruined city. They elaborate a fascinating American folk theory of mirage: 'We saw enough to convince us that the city was at the bottom of the bay, was thence imaged on the clouds and then reflected down upon the quicksilver. It may be that, in certain favorable stages of the weather, the image of the sunken city is thrown upon the glacier, where it resembles a mirage'.

They then ascended the glacier (it took a whole day) and mounted a mirror on a tripod, at a height of five feet, in which they could also see the ruins of the city. 'We were not a scientific expedition' they modestly concede 'but in our own rough way we were able to satisfy ourselves that what is called the "Silent City" is in reality a sunken city resting at the bottom of Glacier Bay' (1890:132). Proof of this was then established by the photographer I. W. Taber (see Pinney 2018:81).

Photographic proofs of phantom cities were to cause problems for Badlam who saw his own mirages and had access to his own photographs (eemingly taken by his daughter, Maude). How was he to establish the authority of his own images? For a start he stresses the community of beholders (he appeals to the testimony of the passengers of the steamer 'Ancon') who shared his vision of mirage. Eight to ten miles south of Pacific Glacier he and his fellow passengers saw 'what seemed to be a block of large white buildings...Beautifully formed spires, apparently three or four hundred feet high reached above the buildings'. Badlam's daughter photographed this and Badlam reproduced this image in his 1890 book where it jostled against Professor Willoughby's and I. W. Taber's images **[Place Fig. 7 here]**. In this evidentiary competition Badlam seeks the autoptic support of a deposition, a 'card' that 'proved the existence of a mirage'. Signed by two gentlemen, Robert Christie and Robert Patterson, it testified that 'we suddenly saw rising out against the side of the mountains what appeared to be houses, churches and other huge structures. It appeared to be a city of extensive proportion, perhaps 15,000 or 20,000 inhabitants' and went on to stress that they had never seen Willoughby's photograph. In this manner Badlam anxiously sought to protect plausible mirages from those which he considered only worthy of 'Baron Munchausen's fairy tales' (1890:137).

Badlam's account conflicts with Valery's assurance that photography taught its users not to see non-existent things. It is highly probable that Badlam witnessed a superior mirage with basic elements suggestive of the architectural forms that he describes so enthusiastically. My assumption is that, like Scoresby, Badlam thought he could see white buildings with spires (but did not) and that the artisan who prepared figure 7, based on a photograph by his daughter, for publication, reworked the detail to bring out elements not present in the original image. The image is reproduced opposite a small line-drawn tailpiece crafted by W. Kimball Briggs **[Place Fig. 8 here]**. This ratchets up the imaginative investment in the phantom city, amplifying the church like structures with spires that appear in the photograph into a thick encrustation of distinct buildings dotted with windows, domes, and minarets.

This desire to be deceived has very deep roots and can be traced back at least to Joseph Addison's 1712 praise of the 'pleasures of the imagination' in *The Spectator* in which he declared that 'Things would make but a poor Appearance to the Eye, if we saw them only in their proper Figures and Motions', noting that 'our Souls are at present delightfully lost and bewildered in a pleasing Delusion'. (Addison 1988:376). Mere "experience" did not prevent reason from straying in the "Wondrous maze".

Figures

1. "Cape Blanco on the Coast of Patagonia", Plate III from Richard Walter, *A Voyage Round the World in the Years MDCCXL, I, II, II, IV. By George Anson, Esq.* London, John and Paul Knapton 1748. Author's Collection.
2. "Lancaster Sound as seen from HMS Isabella", engraving showing Croker's Mountains, based on Ross's own drawing, from John Ross, *A Voyage of Discovery Exploring Baffin's Bay*. London, John Murray 1819. Private Collection
3. "A Remarkable Iceberg". Hand-coloured engraving from John Ross, *A Voyage of Discovery Exploring Baffin's Bay*. London, John Murray 1819. This astonishing image recalls Scoresby's descriptions of a "vast arch or romantic bridge".

4. "Fig.2 – July 9th from William Scoresby, *Journal of a Voyage to the Northern Whale-Fishery*, 1823, facing p. 144. Author's collection.
5. Fig. 2. July 24th from William Scoresby, *Journal of a Voyage to the Northern Whale-Fishery*, 1823, facing p. 164. Author's collection.
6. Reworked version of Figure 3, as it appeared as the frontispiece to Scoresby-Jackson, *The Life of William Scoresby*. 1861. Public domain.
7. "Mirage of Muir Glacier Seen From Glacier Bay on July 23, 1889, from a photograph by Miss Maude Badlam", from Alexander Badlam, *The Wonders of Alaska*, 1890. Author's collection.
8. Line drawn tailpiece by W. Kimball Briggs, from Alexander Badlam, *The Wonders of Alaska*, 1890. Author's collection

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