Captain James Cook, 1728–79, oil on canvas by William Hodges. Source: Wikimedia Commons

The emergence of modern geography, Plymouth, the Pacific and Prussia?

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In May, 1768, Lieutenant Cook left Plymouth and sailed to Brazil and around Cape Horn, reaching Tahiti in April 1769, he touched the coast of New Holland in 1770. Arguably, The Pacific arena witnessed the birth of modern geography, with Prussian scholars at the soul the story. The origins of modern geography are very opaque, but some scholars consider that the long Enlightenment was time when the world was made modern, conventionally from 1685 to 1815 (Withers, 2007, p. 1). It was described an intellectual movement, centred as far as geography was concerned on Konigsberg and Berlin, based on the power of reason, an imperative that could improve the human condition. Stoddart articulated a convincing, but somewhat controversial, claim that a revitalised modern geography developed during the short period of time at the end of the eighteenth century and beginning of the nineteenth century. However, it was an amorphous geography that gradually metamorphosed from geography 'as description' to a much more emancipated and scientifically-oriented geography that permeated the intellectual currents of the European Enlightenment.

Stoddart (1987, pp. 32-5) regards geography as a distinctively objective study, a science that developed during the Age of Reason. This idea is examined in the context of Cook's voyages through the Pacific, particularly by reference to the journey along the coast of New Holland in the autumn and winter seasons of 1770. Geography's faithfulness to rationality and reason is tempered by further changes in the geographical experiment, seen as a movement away from the priorities of navigation and exploration towards a more affective geography. But also, more ominously towards imperialistic tropes and an all too often complicit engagement with racism. Many of geography's progenitors comply with the notion that revitalised modern geography may indeed be coincident with Cook's voyages into the Pacific but perhaps an emphasis on the 'great men' of historical geography tends to cloak rich, complex and more impervious geographies. Further attention to the discourses of geography may lead to improved elucidation and understanding.

The origins of modern geography

Europe had long engaged in extensive maritime trade and exploration from the fourteenth and fifteenth centuries onwards, accumulating map data and knowledge in ever increasing amounts but there was little purpose to this undertaking. Dissatisfied with this state of affairs there arose a point of view that the knowledge ought to be used to test certain assumptions about the links between people and environments (Hubbard, Kitchin, Bartly & Fuller, 2002, p. 24), and the power of reason and rationality would uncover those links (Johnston & Sidaway, 2004, p. 394).

Stoddart (1987, pp. 28-40) refers to a revitalised modern geography that developed over a comparatively short period of time at the end of the eighteenth century and beginning of the nineteenth century. He termed it a European science, an intellectual project based on a set of attitudes, methods, techniques and questions that set geography apart from other branches of knowledge. In Europe, up to the end of the eighteenth century, geography was essentially descriptive, an accessible body of work that began to emerge in England by the 1620s (Cormack, 1997, p.157). Broad in its scope, it aimed to describe the earth creating a unified, true, comprehensive, and complete picture of the entire surface of the planet, or selected parts of the world (Godlewska, 1999, p.2). Its modus operandi depended on mathematical, graphic and literary devices and its aim in presenting a complete representation of the earth was to expand knowledge. For some, geography was a servant to well-to-do class interests and the power of the church (Mayhew, 2000, p. 9); English Tudor undergraduates, at Christ Church, Oxford, drawn from

urban merchant backgrounds, aimed to be better equipped for mercantile careers, diplomatic journeys to Europe and imperial ambitions (Cormack, 1999, p. 45) Those who practised geography appealed to the general curiosity of the reading public and were more interested in presenting the location of phenomena rather than understanding them. Godlewska (1999, p. 3), referring this time to geography in France, explained that 'It is difficult to conceive today of just how nonexplanatory geography then was'.

However, geography 'as description' was also regarded as a science in pre-Enlightenment Europe. It was, admittedly, an 'easy and pleasant' science (Mayhew, 2000, p. 29), science as knowledge as opposed to science as 'certainty grounded on demonstration' (p. 30). It was a science about the situation of places on the earth and the make-up of those places in natural and human terms (p. 30) rather than science in the pursuit of truth (Unwin, 1992, p. 20). Then there is another view of geography prevalent in popular parlance, a traditional starting point for geography as the art of the mappable (Holt-Jensen, 2008).

> 'Cook's mission was at once geographical in its mapping of the Pacific islands, scientific in its attention to natural history, anthropological in its detailed accounts of island customs, and political in its alertness to the possibility of British imperial claims' (Wolff, p.20).

Geography, debatably, now embraces all of Cook's attributes, and much more besides.

The argument, presented here, seeks to examine the change from a sixteenth and seventeenth century geography that was taught at British universities, geographical works that were read by merchants, courtiers, and country gentlemen as well as investors and explorers, (Cormack, 1994, p. 19), a geography whose relationships with cosmography, astronomy, chorography and topography helped determine its nature until the end of the eighteenth century (Mayhew, 2000, p. 27), a geography that was primarily a textual practice rather than one that entertained the notion of fieldwork (p. 27–8) to the emergence of a new form of modern geography, a change in its discipline, what contemporaries held the subject to be, and, in geography as a discourse, the practices through which people came to know the world (Withers, 2007, p. 12).

Gregory (1994, p.11) explained that the discourses of geography percolate through the social practices of the wider community: seen, for example, through seventeenth century maps, Royal courts, Cook's cabin, commandeered by Banks and his retinue of gentlemen, 'the wide-open airy spaces of the field' and the 'stuffed displays of the museum' (Livingstone, 2003, p. 17): practices that involved 'observing, mapping, collecting, comparing, writing, sketching, classifying, reading, and so on' (Withers, 2007, p. 12). Such practices were not confined to any one discipline and they are not expressed in specific geographic vocabularies but use, for example, the languages of cartography, anthropology, botany, zoology and geology (Livingstone, 2003, pp. 9-10) to present the South Pacific as a comprehensible geographic entity.

Stoddart's argument is illustrated by reference to a number of personalities, an inclination towards the 'great men' of history who enlightened the world. And, so the story unfolds, – while Cook was developing his astronomical, surveying and cartographic skills in the cold Atlantic waters off Canada, Enlightenment philosopher Immanuel Kant had commenced long sequence of lectures on physical geography (1756-96) at the university of Konigsberg, East Prussia. When another Prussian, polymath geographer, naturalist and explorer, Alexander von Humboldt, was born in 1769, lieutenant Cook first observed the Pacific Ocean. He was then a skilled seaman with almost twenty years-service in the merchant and royal navies. When he was killed in Hawaii, in 1779, German geographer Carl Ritter was born.

Humboldt and Ritter are regarded by most geographers as the founders of modern geography (Buttimer, 1993, p. 59, Gade, 2011, p. 201, Gregory, 1994, p. 40, Waitt, McGuirk, Dunn, Hartig, & Burnley, 2000, p. 171). Humboldt's synthetic thinking 'seeking laws concerning interrelationships of the physical the biological, and even the human' (Buttimer, 2001, p. 107), his innovative use of maps, insistence on accuracy, his constant search for answers to critical questions and scepticism for past theories, was pivotal to the development of scientific geography. Ritter was another synthetic thinker developing his compendious 19 volume *Erdkunde* a generalised world geography with the earth as the home of humanity. His analysis, that covered only Asia and Africa at the time of his death, was, however, suffused with the author's Christian worldview. Furthermore, Kant gave geography a theoretical justification. He argued that both geography and history, as sciences, extend over the entire span of human knowledge with geography concerned with space and history with time. In dealing with space, geography provides humanity with access to the ordering and categorising of the world (Elden, 2011, p. 11). His popular geography lectures, on physical geography, broad enough to include much of what we would now understand as human geography (Elden, 2011, p. 5), aimed 'to civilise young students to become citizens of the world' (Wilson, 2006, p. 8). They provided

empirical grounding for his philosophical ideas, to guide students in their moral and practical lives (Elden, 2011, p. 3). In short, the lectures provided a propaedeutic, a preliminary instruction, for practical reason (p. 3).

The theoretical justification for Stoddart's argument is predicated upon the development of geography as a distinctly objective science, centred on quantification, concerned with realism in description, systematic classification in collection and comparative method in explanation (Gregory, 1994, p. 19, Stoddart, 1987, pp. 32-5, Withers & Livingstone, 1999, p.1). It was also a geography of social concern, unified by an ecological understanding (Mayhew, 2000, p. 8). It was a geography codified as a discipline through the efforts of Humboldt and his brother Wilhelm in the early nineteenth century, when modern geography was taught at German universities, and degrees and doctorates awarded. Geography then spread across Europe and North American universities in the later nineteenth century (Mayhew, 2011, p. 27).

Implicit in Stoddart's geography is not only accurate mapping that depended on increasingly sophisticated quantification, but also the direct observation of phenomena in the field, thinking about these observations and then through classification and comparison seeking some kind of explanation (Gregory, 1978, p. 16). The aim of the new sciences, such as anthropology, geology, chemistry and sociology, was the explanation of selected aspects of the earth's (or its inhabitants) functioning. To some extent geography was left out of these accomplishments. Explorers such as La Perouse, Cook and Bougainville turned to the findings of other explorers, and the views of the wider scientific community, rather than the obsolete and scarcely interesting world of 'cabinet-bound' descriptively-inclined geographers (Godlewska, 1999, pp. 5-6). Empiricism alone was insufficient in the age of reason. It was Humboldt, according to Bowen (1981), that moved geography from a preoccupation with naïve empiricism towards an integrated study of physical and human phenomena. This notion together with an awareness of the geographer's social responsibilities (Mayhew, 2000, pp. 8-9) were powerful new conceptions. Humboldt believed, for example, that there were no superior nor inferior races throughout the world (Wulf, 2015, p. 108).

Stoddart's objective science must be seen in a wider context, i.e. the philosophical milieu of the Enlightenment: with the power of reason to change human society, to question religious dogma and political authority, and, of science to elucidate understanding of the world (Livingstone, & Withers, 1999, p. 6). It also presaged a more universal change in the nature of sciences, to what Foucault described as a shift from the Classical era [circa 1650-1800] to the Modern era [circa 1800+] (Flynn, 2007, p. 60). The Modern era was the period where geography moved away from naïve empiricism, 'the nature of the life, earth and human sciences shifted from description to explanation and from a focus on surficial phenomena to the theoretical exploration of interior structures' (Godlewska, 1999, p. 236). In short, with the right questions most problems could be addressed and 'enlightenment' would proceed. Such 'enlightenment' was based on an unshakable penchant for exploration and from far-reaching collection and classification of information and specimens (p. 238). Withers (2007, p. 5) recognised an emerging zeitgeist,

> 'People in the eighteenth century understood their world to be changing as a fact of geography, and as a result of processes of geographical inquiry – in the shape and dimension of continents, for example, in the types of human cultures making up mankind, in the reasons plants, animals, and humans were located as they were'.

Notwithstanding these observations, the argument that Cook's voyages through the Pacific revitalised modern geography is more difficult to make than the notion that his voyages were coincidental with the development of modern geography, as seen through the scholarly works of Kant, Humboldt and Ritter. Nevertheless, the former argument is presented here.

Cook and a revitalised modern geography

Firstly, the perception of realism in description is apparent in new developments in artistic representation during Cook's voyages. Secondly, realism and a reliance on accurate measurement is examined in the context of Cook's 1770 chart of Botany Bay.

Cook employed professionally trained artists on all three of his voyages. These individuals learned to shift their emphasis from more traditional styles of British landscape painting to a more empirical approach to nature. They worked side-by-side with scientific illustrators to change their ways of seeing towards a more literal portrayal of the world from a metaphorical one, to embrace a search for 'a scientific language, the advancement of empiricism, and the spread of naturalism' (Livingstone, 1992, p. 133). Attention to detail was paramount. Stoddart (1987, p. 34) explained that, 'The botanical illustrations of Parkinson, and later the depiction of shells, birds and minerals with minute accuracy became characteristic'. Artists, like Parkinson, were also influenced by the emergence of the new

sciences, particularly, the sciences of visible nature: anthropology, geology, botany and zoology (Gregory, 1994, p. 23) in their 'European vision of the South Pacific' (Smith,1985, cited in Livingstone, 1992, p. 130).

Superficially, map making had changed from a preoccupation with creativity and imagination towards direct experience and precise measurement. Cook's charts were designed to act as accurate guides to assist navigators, to ensure their survival at sea. All the same, the most factual of maps, ones that embodied empirical truths were also replete with ambiguity and ideology (Edney, 1999, p. 169). They were also fit for purpose, omitting salient geographical detail. Cook's chart of Botany Bay titled 'A sketch of Botany Bay in New South Wales: latitude 34°00' S' (Cook, J., & New South Wales. Government Printing Office, 1893) was allied with Admiralty regulations and instructions to record new coasts visited and to produce charts.

The sketch map of Botany Bay was a realistic depiction obtained through painstakingly accurate land-based triangulation surveying, sightings from the Endeavour, from ship to shore and from small boats offshore. Soundings were also taken and rocks, shoals and sand deposits recorded. The resultant chart, later redrawn at the British hydrographic office, shows a remarkable degree of verisimilitude, with hachures indicating the steep inclines offshore, stippling indicating shoals off Point Sutherland and the presence of freshwater sources at six location. But there are also some rhetorical flourishes on the chart with an inset sketch of the Endeavour inside the compass rose and another depiction of the ship situated to the north of the aforementioned shoals. Vegetation on land was represented as a highly stylised open savanna. The sketch map is clearly designed as a chart for sailors but was also a contrived 'picture' of the landscape, much more than a realistic replication of a small portion of the world, or, an abstraction of reality.

None of the rich variety of terrestrial vegetation is recorded neither is the presence of Indigenous people. Reconstructions of the vegetation communities surrounding Kamay/Botany Bay undertaken to correlate the collections made by Banks and his fellow workers, in the eight days the crew spent in the area, indicate that the specimens were taken from a wide variety of communities (Benson & Eldershaw, 2007), from Swamp Sclerophyll Forest to Littoral Rainforest communities, from heaths to the Turpentine-Ironbark Forest. In all, over this short period of time, some 130 species of plants were collected, eventually giving rise to 94 coloured sketches (Benshaw & Howell, & Royal Botanic Gardens, Sydney, 1990, p. 28), but none are recorded on Cook's chart.

Stoddart's inclusion in his set of criteria lists systemic classification in collection. This best applies to Banks and his party rather than to Cook. Following the Linnaean tradition their classification was concerned with visible and external features of plants but it was also a theory-based description, focused the reproductive function (Godlewska, 1999, p. 13). On board the Endeavour was an extensive library of natural history texts and all manner of devices for snaring and preserving animals. According to Cook's biographer, Beaglehole (Cook, 1955, p. cxxxvi, cited in Gregory, 1994, p. 18) 'No people ever went to sea better fitted for the purpose of Natural History'.

Cook was involved in a more pervasive and persistent geographic tradition: the descriptive one, and an empirical one at that, 'In this Chart I have laide down no land not figur'd out any shore but what I saw my self, and thus far the Chart may be depended upon' (Cook, 1955, p. 52, cited in Carter, 1987, p. 22). But it was also a descriptive tradition with a wider purpose. His maps and charts, according to Carter (2010), were designed to record exact information, they left traces of 'particular encounters and the memories of particular experiences' (Gregory, 1994, p. 25). Cook was an 'explorer of horizons, and not a discoverer of countries, his realm of competence was confined to a coastal swath bounded by the visible horizon' (Carter, 1987, p. 27). Along that coastal swath he named particular prominent features: Pigeon House Mountain or Mount Dromedary, and on the N.E. Australian coast 'where the Lords of the Admiralty flitted from cape to cape' (Cook, 1955, p. cciv), but the names were vulgar mnemonics (Seddon. 1998, p. 42) for geographical coordinates. In fact, meridians of longitude spread out from Greenwich, the nerve centre of the British Admiralty. 'Every place named by Cook was also plotted by him on this grid, knitted into the fabric woven by the world's then greatest naval power and thus tied to the Britain which he served' (p. 42). Cook's descriptions had an ulterior purpose. The spatial history of Australia was consolidated when the European 'discoverers', explorers and settlers were 'choosing directions, applying names, imagining goals, inhabiting the country' (Carter, 1987, p. xxi).

Byangee Walls and Pidgeon House Mountain NSW, looking east. Source: Wikimedia Commons

The third element in Stoddart's reconstruction of the beginning of modern geography, comparative method in explanation, that analyses data seeking common patterns and distinctions, could be seen in embryonic form in the Endeavour crew's expeditions around Botany Bay. On May 3, 1770, Cook, Solander and Munkhouse boarded the pinnace to reach the head of the bay where Cook described a more productive environment than the sandy shores beyond the first watering place near Point Sutherland, 'instead of sand I found in many places a deep black Soil which we thought was capable of produceing any kind of grain at present it produceth besides timber as fine meadow as ever was seen' (Cook n.d. & South Seas, 2004, Manuscript 1, p. 230). The three gentlemen may have been comparing podsolised sands near Point Sutherland with those of swamp forests in the Cooks River estuary or locations further upriver at Kogarah Bay where the Turpentine-Ironbark Forest community flourished on a Wianamatta Shale ridge.

According to Stoddart (1987, p. 34) comparative method in explanation was seen most explicitly during Cook's second voyage when Rheinhold Forster tried to explain the existence of uplifted coral reefs in the Pacific in relation to the perceived emergence of the land from the sea in Scandinavia. When George Forster, his son, published an account of Cook's second voyage he insisted that a naturalist's task was much more than to bring back a collection of butterflies and dried plants it was rather to make sense of nature, of showing how the different facets of terraqueous globe were interrelated and interdependent (Gascoigne, 2007, p. 147). It was George Forster who so inspired Humboldt with his stories of a new era of scientific travel that had begun with Cook's expedition, a venture into 'comparative anthropology and geography' (Buttimer, 2001, p. 107).

The comparative method in explanation was most apparent in geography's engagement with anthropology. Gregory (1994, p. 5) believed that modern human geography had been defined by 'a series of encounters with anthropology in the eighteenth century', encounters that possibly date back as far as 1502 when Amerigo Vespucci recorded in his South American journal 'everything from the childbirth practices to the religious customs of the peoples he encountered' (Livingstone, 1992, p. 46). Anthropology sought to understand people in their own social and cultural context rather than see them from afar as alien, exotic, primitive, savage or barbarous (Wolff & Cipolloni, 2007, p. xii).

Cook's forays into anthropology and ethnography progressed from his initial descriptions of native people living on the Bay of Good Success, Tierra del Fuego, on Jan 15, 1769, where he attempted to relate the apparently harsh environment of the Haush to their resilience in the face of adversity (Thomas, 2018, p. 50), to his emergence 'as an ethnographer of no small talent' (Livingstone, 1992, p. 127). He observed the apparently strange burial customs and tattooing practices across the Pacific and reflected on adolescent female sexuality in Tahiti. Cook's observations on the natives of New Holland after the ship departed from Possession Island that 'ranged over physique, hair, ornament, body paint and piercing, canoes, subsistence and houses' (Thomas, 2018, p. 128) were another case in point. But more revealing was his quite astounding, and very enlightened, philosophical pronouncement about the natives of New Holland that 'live in a Tranquillity which is not disturb'd by the Inequality of Condition: The Earth and sea of their own accord furnishes them with all things necessary for life; they covet not Magnificent Houses, Houshold-stuff &C[a]'. (Cook, & South Seas, 2004. Manuscript 1. p. 299).

The geographical experiment at *Waalumbal Biri*

The 'geographical experiment' (Livingstone, 1992, p. 177), seen through the monumental efforts of Ritter and Humboldt, sought to combine nature and culture under the same umbrella (Bonnet, 2008, p. 87). The relationship between people and environment in the Enlightenment was complex. Firstly, there was a powerful divine or theistic tradition expressed in 'man's' dominion over the fish in the sea and the fowl in the air (Porter, 1999, p. 421) combined with a rationalist assumption emanating from Enlightenment natural philosophy that nature may be mastered, managed, and used by humanity (p. 425). Such notions shed some light on people-environment relations when Cook's voyagers entered *Waalumbal Biri*, Endeavour River, in June 1770, in order to repair their ship. Put bluntly, 'They came to exploit the natural and social environment with no sense of obligation to replenish what they exhausted or to feel the consequences of the changes they caused' (Dening, 1980, p. 23, cited in Nugent, 2005, p. 33). The fishermen and foragers were particularly successful in these terms. 'So much fish was taken, that each man had two pounds and a half; and plenty of greens were gathered, which boiled with the pease, their fare was deemed excellent' (Rhys, 1999/1906, p. 79).

However, the incident that best illustrates the gulf between the duties, rights and entitlements of the strangers and Bama (rainforest Aboriginal people) was the refusal of the ship's officers to share turtles with

Guugu Yimithirr. On July 19, 1770, the Endeavour was visited by ten Bama, armed with spears, who 'were very desirous of having some of our turtle' (Cook & South Seas, 2004, manuscript1, p. 267) which were 'probably as great a dainty to them as to us' (Hawkesworth, 1773, & South Seas, 2004, pp. 580-584). Bama attempted to move two of the turtles to the side of the ship, to the gangway, near to where their canoe was moored, but the sailors reclaimed them. Several more attempts were made until the warriors paddled off in their canoes. Apparently infuriated and perplexed by the incident, one Bama took up a handful of dry grass and lit the bundle from a fire under a kettle of pitch and 'in an Instant the whole place was in flames' (Cook, & South Seas, 2004, manuscript1, p. 267) and the Endeavour's precious fishing net was nearly destroyed. Cook was 'obliged to fire a musquet load[ed] with small shott at one of the ri[n]g leaders which sent them off' (p. 267).

As far as Bama were concerned the turtles belonged to them. According to Molony (2012, p.6), 'They were treasured as an item of food but a large part of the year had to pass before they were caught when they came ashore to lay their eggs'. The Endeavour had arrived during the season of *Guumbamu,* just before the beginning of turtle hunting season, when sea urchins and crabs were fat and ***wukay***, a type of yam, ready to eat (Hornsby, 2012, pp. 8-9).

Apparently, Cook did not understand that, 'these 'Indian' peoples practiced reciprocal food sharing and expected it of others, nor that they might consider turtles to be the produce of their own estate, which could not be stolen by strangers, white or black' (MacCallum, 2012, p.11). The Captain, who was also the ship's purser, assumed the turtles were his to keep or give away. Thomas (2018, p. 122) questioned this perception believing the Cook would have known all too well who owned the trout, hare, pheasant, deer and other game that roamed estates in his native Yorkshire. On the other hand, it would be wrong to project current environmental ideals upon the Endeavour's company. It would be an overreaching act to suggest that Cook, with his rural background, would have realised that Europeans had managed and mastered nature for centuries, 'clearing forests, embanking, ploughing, planting, mining' (Porter, 1999, p. 425)?

The ancients and the moderns

Stoddart (1987, p. 28) eschews more typical histories of geography that proclaim the roles of Eratosthenes, Strabo and Ptolemy, followed by Hakluyt, Purchas, and Varienius. But there are some continuities that are worth examining. The 'ancients' were as concerned with describing the earth at various scales in the form of ***topos*** as the study of place***, choros*** as the study of a region***,*** and ***geos*** as the study of the entire face of the earth (Barnes, 2011, p. 382, Mayhew, 2011, p. 29) as were geographers in the sixteenth, seventeenth and eighteenth centuries. Strabo's endeavour to describe every detail of the Greek world of the 7th century BCE 'based on both his own travels and also on authoritative sources and other travellers' accounts' (Cormack, 1999, p. 131) can be compared with Hakluyt's. Described as an academic, diplomat, spy and churchman (Cormack, 1994, p. 21), in the sixteenth century he lectured on cosmology at Oxford, a term that best encompassed what was later to become geography (Unwin, 1992, p. 62).

There are strong currents involving mathematical and astronomical interests based on measurement of the dimensions of the Earth, its place in the cosmos, and the production of maps, that stream through geography's history. Additionally, there are a number of philosophical concerns centred on an interest in the relations between of humanity with the natural world (Holt-Jensen, 2009, p. 35). Varenius' *Geographia generalis* (1650) explicitly drew from Ptolemy as far as the former is concerned but was also influenced by Reformation theologian, mathematician and astronomer Keckermann's *Systema Geographicum* (1611). Some contemporary geographers regard Varenius' work as marking an intellectual divide that separated ancient and medieval geography from modern geography, in effect a transition from Renaissance to Enlightenment geography (Livingstone, 1992 p. 86, Mayhew, 2011, p. 26, Smith, 1992, p. 263, Unwin, 1992, p. 67). Smith (1992, p. 263) maintains that 'The separation of geography from cosmology and astronomy, philosophy and mathematics was a historical process and Kant like Varenius was regarded as a watershed figure' James Cook would have appreciated a section in *Geographia generalis* that focused on the needs of mariners, on navigation, on latitude and longitude of places in comparison with each other.

Furthermore, geography as navigation, continued to be important. Morrill's (1840) *Geographical manual for teachers* maintained that school geography should be divided into three parts: mathematical, civil or political and physical geography (Morrill, 1840, p. 1). Cook had had obviously developed a deep understanding what came to be understood as mathematical geography. An extended list of instructions had been drawn up by the Admiralty for sailors who were about to embark on long sea voyages. They included:

> To observe the declination of the compass, or its variation from the meridian of the place, frequently

> marking with all the latitude and longitude of the place . . . To make plots and draughts of the prospect of considerable coasts, promontories, islands and ports, marking the bearings and distances as near as they can. . . . To take exact care, to observe the trade winds, about which degree of latitude and longitude they first begin, where and when they cease, or grow stronger or weaker' (National Museum Australia, 2012, transcript, para. 4).

According to Robson (2012, p. 1) 'For James Cook, the production of a new chart was his principal reason for going to sea', and as Haggett (1990, p. 7) argues the map is a diagnostic touchstone used to determine whether a text is truly geographical.

The development of geography as exploration also shifted over time. Some earlier explorers were very honest about their endeavours. 'Bernal Diaz, frankest of conquistadores, wrote that he and his like went to the Indies 'to serve God and his Majesty, to give light to those who were in darkness and to grow rich, as all men do" (Parry, 2010/1963, p. 33) but geography changes course as society changes. The more deliberately scientifically oriented exploration, enhanced by new navigation and cartographic techniques together with substantial capital injection from powerful European maritime powers (Heffernan, 2009, p. 6) assisted in this regard.

Joseph Conrad's 1924 National Geographic essay, 'Geography and some explorers' (Conrad, 1924, 10–17) saw Cook's voyages as typifying *Geography Militant*, seen as a thorough quest for certainty about the geography of the world, a world where there were open spaces to explore and a society that espoused an absolute faith in science (Driver, 1996, 340–1). This commitment underpinned the European Enlightenment, involving the power of human reason to change society (Livingstone & Withers, 1999, p. 3) and to seek a better society (Slater, 1997, p.56). Geography as exploration is exemplified in Forster's account of Cook's second voyage in chapter headings that still resonate with many school geographies today: 1. The earth and its strata, 2. Water and the ocean, 3. The atmosphere, 4. The changes of the globe, 5. Organic bodies, and 6. The human species (Stoddart, 1996, p. 469).

There was also an affective component to geography as exploration, an attachment to the accounts in the form of journals, popular fiction and poetry. Dampier's,1697, *New Voyage round the world* was 'simply but vividly written' (Spate, 1988, p. 25) and 'Dampier provided raw material for eight of Defoe's novels and for Swift's Gulliver's Travels; while Coleridge's Ancient mariner was drawn from a mate of Shelvocke's [a disreputable privateer]' (p. 25). This tradition was enhanced by the presence of professional artists on the Endeavour, commencing a long commitment to the geography of vision (Cosgrove, 2008), offering other ways of seeing, imagining and representing the world. Geography as exploration can be evocative, '. . . you feel the dust in your eyes, the sand between your toes, the salt spray on your face' (Stoddart, 1996, 471). Moreover, geography as exploration still survives in the lavishly illustrated pages of the National Geographic magazine. It still persists in the geographer's partiality for fieldwork

Nonetheless, Conrad's *Geography Militant* also suggests another trope: imperialism, which in its starkest guise has been described as including 'territorial acquisition, economic exploitation, militarism, and the practice of class and race domination (Hudson, 1977, p. 12, cited in Peet, 1998, p. 12). Carter (2010) argues that Cook's practice of naming places on the east coast allowed colonisation and dispossession to be set in train, making the landscape familiar to future colonisers and alien to native inhabitants (Gregory, 1994, pp. 171–2). Smith (1985, p.2) contends that ships like the Endeavor combined the values of a fortress and a travelling laboratory, bringing together more precisely one implication of Conrad's title, *Geography Militant*. Enlightenment philosophy has been seen by some as a seedbed for modern racism (Appiah, 2019, p. 6, Kobayashi, 2003, p. 544–6), and Anderson observed that Enlightenment ideas posed a conundrum for Banks who mused over the apparent contradiction, of human presence and uncultivated land on the east coast, arguing, 'that because there was no cultivation along that coast, either the inland of the continent must be unpeopled or the coastal Aborigines must be akin to monkeys' (Anderson, 2005, p. 9).

Geographers divided

There is a plethora of geographers from a variety of inclinations and professional interests that indicate that revitalised modern geography may indeed be coincident with Cook's voyages into the Pacific. Stoddart's arguments come from a geographer steeped in natural history. Similarly, Bowen, (1981), who surveyed geographical scholarship from Bacon to Humboldt, shared his ecological visions of geography, to laud Humboldt's vision of early nineteenth century science (Livingstone, 1992, p. 7). Those with an inclination towards regional geography such as Hartshorne (1961/1939, pp. 48–54) or Dickinson (1969, pp. 22, 277–8, cited in Livingstone, 1992, p. 6) emphasise the contributions of Humboldt and Ritter towards the

regional concept. Buttimer, coming from a humanistic tradition, sees Humboldt's *Cosmos* imbued with the humanist spirit, (1993, p. 59) but Schaefer (1953, p. 228), a champion of the quantitative tradition, maintained that Humboldt and Ritter recognised that their major concern was the manner in which natural phenomena, including people, were distributed in space. Crang (1998, p. 18), a cultural geographer, would see Humboldt's ideas expressed in the notion that geography is the art of seeing how land and life differs across space, and Cresswell (2013, pp. 40–1), another geographer from the cultural tradition, sees Ritter as more interested in the human world than Humboldt, with a focus on comprehending the interconnections between people and nature.

Other geographers seek recourse to geography in Ancient Greece or pre-Enlightenment times, in their search for the birth of modern geography whether they are writing from the tradition of historical geography (Mayhew, 2011, pp. 21–38) or spatial analysis (Barnes, 2011, pp. 381–4). Some are more cautious about the timing of the emergence of modern geography thought, seeing it as emerging- certainly not fully formed – in the Enlightenment. (Godlewska, 1999, p. 2).

Some see Enlightenment geographies as an impediment to the development of contemporary critical geographies. Harvey, regards Kant's adherence to absolute space, rather than see space as simultaneously absolute, relative and relational (2007, p. 45), as a constraint on the development human geography. Geography was unable to address grander, more difficult questions when it was later caught in the 'dead science of spatial ordering' (p. 46).

Whose geographies?

This account has referred to those who profess to be geographers, for all, or parts of their lives. There are others referred to who write about geography and there are those scholars who are co-opted into the geographic enterprise (Unwin, 1992, pp 45–6). Contemporary geographers tend focus on discourses of geography rather than the discipline of geography. They tend to repudiate geographies seen through the lives and works of a series of eminent gentlemen, or through plotting the progress of geography from 'an unenlightened past to a glorious present' (Livingstone, 1992, p. 5).

Stoddart sought to present a contextual history of geography that focused on objective science. He concentrated on a small corpus of 'great men' and his enthusiastic account is permeated with the spirit of adventure. Another reading would examine the development of modern geography from within a 'map' of the intellectual landscape (Gregory, 1994, p. 5), a chart of its emergence together with other disciplines in the life, earth and human sciences. Stoddart goes further to argue the modern geography diverged from other disciplines, that scientific methods of observation, classification and comparison to peoples and societies made geography distinctive from other branches of knowledge but in reality, geography gained from its engagement with anthropology, cartography, geology, botany and zoology. An affective component was prominent in the emergence modern geography, one made more eloquent in Humboldt's writings, 'where fresh data from geographical explorations were exciting popular imaginations' (Buttimer, 2001, p. 106) and from Ritter where the gift of reason meant that, for the Earth's inhabitants it 'is not merely the place where they may stand, the cradle where they may sleep, the home where they may live, it is the school where they may be trained' (Ritter, 1865, p xvi).

The Age of Reconnaissance (Driver, 1992, Parry, 2010/1963), that preceded the Age of Reason, was undergirded by mercantilist or militaristic rather than scientific ideologies (Edney, 1999, p. 168) but insidious geographies of race and imperialism also emerged during the Enlightenment. Whether continuity played a bigger role, than pivotal change over the comparatively short period of time at the end of the eighteenth century and beginning of the nineteenth century, on the development of modern geography is debatable. Using the geographic concept, scale, to hone in on the passage of the Endeavour along the coastline of New Holland in 1770, and, to examine the kinds of scientific geography that it engendered may focus too much on the particular rather than those ideas that emanate from the longer historical view?

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