Recapping the History of the Antipodes: Reappraising Absolute and Relative Connotations

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During Stanley's Antipodean tour, his ship was steaming towards Wellington, New Zealand, when he chanced to meet his old friend William Webb of Newstead Abbey in the smoking room.
Stanley: The Impossible Life of Africa's Greatest Explorer (Tim Jeal, 2007, 423)

Abstract

During the first half of the 20th century teaching and learning about the antipodes were considered a fundamental element within the undergraduate geography curricula. However, in the 1970s the antipodes were absent from Bacon's surveys of domain, core, and sphere concepts in human and physical geography. In fast forwarding to the 21st century, the term has virtually disappeared from introductory-level geography curricula. This exploration confirms that rather than being an obscure concept, the antipodes percolate across a diverse range of illustrations in mathematics, cartography, geology, astronomy, to cultural geography, literature and social theory. Our discourse supports reclaiming the antipodes for their geodetic value within the undergraduate introductory geography curriculum, but stresses sensitivities when using relative connotations in social, cultural, and political arenas.

Keywords: Antipodes, geodesy, geographic illiteracy, absolute location, relative location

Introduction

In 1892, Henry Morton Stanley lectured on his exploits crossing the Dark Continent to the delight of Antipodean audiences in New Zealand and Australia (Jeal, 2007). We authors plan to embark on our own antipodal tour to explore this fascinating but often ignored geographic concept. Though our discoveries might not be as memorable as Stanley's infamous and perhaps never uttered, "Dr. Livingstone, I presume," the authors' strategy is to reappraise antipodes and its absolute and relative connotations (Landing, 1959). This article explores potential applications of utilizing the antipodes in teaching and learning about geography.

Nowadays it is more probable to encounter the antipodes in book titles written by non-geographers than in the undergraduate geography curricula. One might locate books with titles espousing the literal and/or figurative meanings of antipodes, for example: *Terra Incognita: Mapping the Antipodes before 1600* (Hiatt, 2008); *The Idea of the Antipodes: Place, People, and Voices* (Goldie, 2010); and, *The Sisters Antipodes* (Allison, 2009)[1]. Perhaps these scholars are counting on the mystique of this intriguing word to captivate readers, while publishers are relying on an interesting title to generate sales. These authors (Hiatt, Goldie, and Allison) are all English professors, and, yes, geographers appreciate contributions from scholars across the academic spectrum it behooves us to reclaim the antipodes as an important geographic concept.

Antipodes receive even less coverage than another fascinating yet related geographic phenomenon—the International Date Line (Albert, 2008; Albert, Morris, & Tiller, 2014; Morris, Albert, & Tiller, 2010). While the authors admit that the word *antipodes* is obscure and not often brought up in conversations, there is a singularity of exploring the antipodes for reintegration within geographic curricula. Children often imagine digging straight through the center of the Earth and popping out to the other side. For countless youngsters this other side was China irrespective of shoveling from New York, England, Australia, or New Zealand (Goldie, 2010; J. Monk, personal communication, February 28, 2014). Soon, however, these children realized that China was just a convenient other location—a place far way and exotic.

Background

The word "antipodes" derives from Greek and Latin and translates as opposite (anti) feet (podes) according to the *Oxford English Dictionary Online*

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1) These and many other titles containing "antipodes" can be located on Amazon.com>search books>antipodes.

(OEDO, 2014)[2]. Since the usage of antipodes and its derivatives has historical and regional connotations (i.e., northern versus southern hemisphere) two sets of dictionary definitions follow. The first, and representing a British-centric perspective, is from the *Oxford English Dictionary Online* (OEDO, 2014), and the second, serving an Australian population, is from the *Macquarie Dictionary Online* (MDO, 2014). In addition, while there is an *Australian National Dictionary*, it is published by Oxford University Press. To guard against biases infiltrating from the same publishing house, the authors chose to use *Macquarie Dictionary Online* from the Macmillan Publishers Group Australia (Table 1).

Three of the five OEDO entries for "antipodes" are considered obsolete; none of Macquarie's entries for the same are obsolete (Table 1). While obsolete words are no longer appropriate for contemporary usage, scholars should be aware of antiquated meanings within their field to understand historic sources or purposeful symbolism (D. Hill, personal communication, November 15, 2013). Both the OEDO and the MDO entries for *antipodes* support its geodetic meaning as opposite points or regions on the Earth or globe. So here, the northern and southern hemisphere lexicons are in concordance with the absolute sense of *antipodes* as a standard geodetic element with numerous applications. These dictionaries, however, deviate in their usage of Antipodes and Antipodean for Australasia. The OEDO does not associate Antipodes with Australasia. Remarkably, the MDO emphatically does associate the term in one instance with "Australia" and qualifies another after a semicolon with the phase "Australasia, as the Antipodes of Britain" (Table 1). Both the previous quotes describe this region as relative to Britain, and hence, recognize the bygone era of colonial imperialism. At least the latter definition insinuates that without noting Britain, using Antipodes to reference Australasia is incomplete, inaccurate, and imperfect.

Both the OEDO and MDO associate "Antipodean"—the adjective—as pertaining to Australasian and Australian, respectively. Again, the MDO qualifies its listing with "[O]f or relating to the British antipodes" and further records its noun form as "an Australian or New Zealander." That the OEDO is more conservative than the MDO in using Antipodes and Antipodean to reference Australia or Australians, New Zealand or New Zealanders, or as a

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2) The OEDO lists twenty-five entries under the heading "the opposite of something," these include: contrary, reverse, the contraverse, negative, nothing less, diameter, different, contrariwise, oppositive, opposition, counterpoint, contrariety, opposite, antipathy, other thing, antipodes, contra, inverse, contrast, converse, contrariant, antipole, obverse, antithetic, and contradictory. With so many alternatives for the opposite of something, most of which are rather mundane, it is no wonder an exotic word like antipodes enjoys some notoriety and usage among scholars outside geography.

regional moniker is understandable in this era of political correctness. It is ironic that the MDO recognizes colonial vestiges, notwithstanding the imperial hegemony suggested with "the Antipodes."

Table 1. Comparison of OEDO and MDO for Antipodes and Antipodean.

	Oxford English Dictionary Online	**Macquarie Dictionary Online**
Antipodes, n.	†Those who dwell directly opposite to each other on the globe, so that the soles of their feet are as it were planted against each other; *esp.* those who occupy this position in regard to us. *Obs.*	
	†*fig.* Those who in any way resemble the dwellers on the opposite side of the globe. *Obs.*	
		Australia; Australasia, as the Antipodes of Britain; a group of uninhabited islands in the South Pacific, belonging to New Zealand.
	Places on the surfaces of the earth directly opposite to each other, or the place which is directly opposite to another; *esp.* the region directly opposite to one's own.	Points diametrically opposite to each other on the earth or any globe. The part or parts of the world diametrically opposite.
	transf. The exact opposite of a person or thing. (In this sense the sing. *antipode* is still used.) at antipodes phr. in direct opposition.	The direct or exact opposite (sometimes construed as singular).
	† As adv. (orig. n. in apposition) in phrases like to walk antipodes to. *Obs.*	
Antipodean, adj. and n.	Of or pertaining to the opposite side of the world; *esp.* Australasian.	Of or relating to the British antipodes; Australian. n. an Australian or New Zealander.
	humorously, Having everything upside down.	
	fig. Of or pertaining to direct opposition; diametrically opposed (*to*).	adj. of or relating to the antipodes.

Notes: *adj.* = adjective, adv. = adverb, *esp.* = especially, *fig.* = figurative, *n.* = noun, *phr.* = phrase, *transf.* = transferred sense, Obs. = Obsolete, † = Obsolete.

Because we are dealing with a moving target, defining these words to the satisfaction of people of different ages and from different regions is problematic. The ambiguity became clear over an email discussion involving individuals from the United States, Australia, and New Zealand. One of the New Zealanders felt "that the younger ones in NZ don't tend to use the term Antipodes. Maybe some are unaware even of what it means. It's more likely they would say 'down under' or maybe 'Australasian,' but not 'Antipodes' or 'Antipodean'" (J. Monk, personal communication, February 28, 2014). These words, however, have relevance in certain contexts. For example, Ruth Liepins speaks of an "Antipodean openness to innovation and improvisation" perhaps contrasting with historic and persisting social class consciousness within Britain (Monk & Liepins, 2000). Another Australian, a colleague from Sam Houston State's College of Criminal Justice, echoed these sentiments (S. Hughes-Stamm, personal communication, February 28, 2014). A more complete comparison among American, British, Australian, and New Zealand dictionaries would be enlightening, however, beyond the scope and intent of the authors.

Historical Context and Early Controversy

Crates of Mellos (2nd century, B.C.) depicts four landmasses more or less symmetrically distributed within the sphere (Figure 1a). The four landmasses were *Oikoumene*, or known world, and three others separated by relatively narrow and crossing oceans (Thrower, 2007). The *Periokoi*, *Antoikoi*, and *Antipodes* landmasses were situated to spatially balance Oikoumene within the sphere (Raisz, 1948). The Antipodes persisted on *mappaemundi* into the Middle Ages when eventually put to rest after the voyages of Captain Cook (Edson, 1999).

The zonal concept map that originated during the Middles Ages is of crude design with mirror-image climate distributions across the equator (Figure 1b) (Thrower, 2007). The modern version of the zonal concept map demonstrates that temperature correlates with distance from the equator; notwithstanding that because of spatial differences in the distribution of land and water, cloud cover, ocean currents, and other factors, actual patterns of frigid, temperate, and torrid deviate somewhat from the idealized climate zones. While the climate zones (i.e., north and south temperate zones) are spatial antipodes or mirror images, the respective seasons are also opposite. Versions of the zonal concept maps are still depicted centuries later in introductory meteorology textbooks (Lutgens & Tarbuck, 2001).

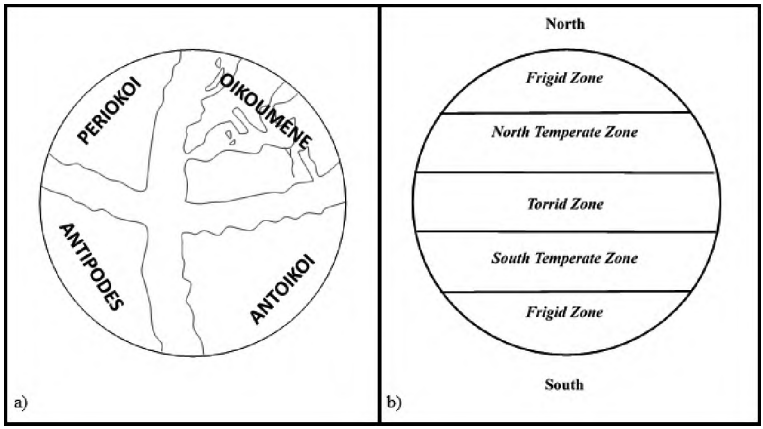

Figure 1. a) The Antipodes is conspicuously present on this world map attributed to Crates of Mellos, 2nd century, B.C. b) Idealized climate zones from the Middle Ages (redrawn by first author after Thrower, 2007, 22 and 41).

Before the antipodes became a fixed geodetic fact, controversies swirled around as whether humans could exist on the opposite side of the earth. According to Saint Augustine, a fifth-century theologian:

> *As to the fable that there are Antipodes, that is to say, men on the opposite side of the earth, where the sun rises when it sets on us, men who walk with their feet opposite ours, there is no reason for believing it. Those who affirm it do not claim to possess any actual information; they merely conjecture that, since the earth is suspended within the concavity of the heavens, and there is as much room on the one side of it as on the other, therefore the part which is beneath cannot be void of human inhabitants. They fail to notice that, even should it be believed or demonstrated that the world is round or spherical in form, it does not follow that the part of the earth opposite to us is not completely covered with water, or that any conjectured dry land there should be inhabited by men* (Loughlin, 1907).

The idea that Antipodeans emerged independently from the offspring of Adam and Eve challenged essential tenets of early Christians about the unity of the

humans, original sin, and redemption. Those believing in the antipodes during this time were considered heretics and more precisely antipodists (Oxford English Dictionary Online, 2014). Later circumnavigating explorers confirmed a spherical Earth and "discovered" dwellers inhabiting the southern hemisphere—science and religion were reconciled for the moment (Bergreen, 2003).

Antipodes Wax then Wane

Once a standard element of grade school (Belthuis, 1950; Warman, 1970), high school (Landing, 1959) and college-level geography curricula (Farnham, 1906; National Council for Geographic Education, 1911) coverage of antipodes has faded into oblivion over the last several decades. Bacon (1979) and Bacon and Green (1981) canvassed 12 introductory human and 14 physical geography textbooks published from 1971-1980 to identify core, domain, and sphere concepts. Their study showed that while latitude, longitude, meridian, parallel, and Prime Meridian chart as core and domain concepts, conspicuously missing were the antipodes.

The term *antipodes* continues to receive almost no coverage within undergraduate introductory physical, human, and world regional geography textbooks. This became all too evident when searching for "antipodes" within 12 introductory physical, human, and world regional textbooks (Table 2) using Amazon.com's Look Inside! feature. These searches failed to find a single substantive hit for *antipodes* with the exception of two human geography textbooks which contained a small number of bibliographic citations from the well-known geography journal *Antipode* (Domosh, Neumann, Price, & Jordan-Bychkov, 2010; Fouberg, Murphy, & de Blij, 2012).

Hobbs' (2009) *World Regional Geography* does contain a discussion about antipodes without ever using the term "antipodes" or its derivatives, in an account of the land versus water hemispheres. According to Hobbs, if one orients a globe over the United Kingdom, it becomes the center of a land hemisphere core containing 80 percent of the world's land and 90 percent of the world's population. Contrariwise if one orients a globe over New Zealand it becomes the center of a water hemisphere periphery containing 20 percent of the world's land and 10 percent of the world's population. The United Kingdom's centrality within the land hemisphere garnered it an excellent relative location with respect to other destinations along with concomitant political and economic advantages (Hobbs, 2009). Hobbs, a geographer from the United States, was correct in not labeling the water hemisphere as the Antipodes, even though the *Cambridge English Dictionaries Online*—American English (CED-AE, 2014) version defines this word as "a way of referring to Australia and New Zealand by people living in the northern hemisphere." The CED-AE entry states "the Antipodes" is mainly used within a humorous context, and for an academic account such as given in Hobbs' *World Regional Geography*, he was right not

perpetuating this obsolete, colonial, and regionally diverging nomenclature for Australasia.

Table 2. Survey of undergraduate physical, human, and world regional geography textbooks published from 2006-2013, available from *Amazon.com*.

Physical Geography
Holden, J. (2011). *Physical geography: The basics*. New York: Routledge.
Huggett, R. (2010). *Physical geography: The key concepts*. New York: Routledge.
Petersen, J. F., Sack, D., & Gabler, R. E. *Physical geography* (10th ed.). Belmont, CA: Brooks/Cole.
Strahler, A. H., & Strahler, A. (2006). *Introduction to physical geography* (4th ed.). Hoboken, NJ: Wiley & Sons.
Human Geography
Domosh, M., Neumann, R. P., Price, P. L., & Jordan-Bychkov, T. G. (2010). *The human mosaic: A cultural approach to human geography* (12th ed.). New York: W. H. Freeman and Company.
Fouberg, E. H., Murphy, A. B., & de Blij, H. J. (2012). *Human geography: People, places, and culture* (10th ed.). Hoboken, NJ: Wiley & Sons.
Kuby, M., Harner, P., & Gober, P. (2013). *Human geography in action* (6th ed.). Hoboken, NJ: Wiley & Sons.
World Regional
Bradshaw, M., White, G. W., Dymond, J. P., & Chacko, E. (2009). *Contemporary world regional geography: Global connections, local voices* (4th ed.). New York: McGraw-Hill.
de Blij, H. J., Muller, P. O., & Nijman, J. (2012). *Geography: Realms, regions and concepts* (15th ed.). Hoboken, NJ: Wiley & Sons.
Hobbs, J. J. (2009). *World regional geography* (6th ed.). Belmont, CA: Brooks/Cole.
Lew, A., Hall, C. M., & Timothy, D. (2008). *World geography of travel and tourism: A regional approach*. Oxford, UK: Butterworth-Heinemann.
Pulsipher, L. M., & Pulsipher. A. (2011). *World regional geography: Global patterns, local lives* (5th ed.). New York: W. H. Freeman and Company.

Antipodes: Absolute and Relative

The antipodes, as an absolute term, focuses on accuracy and precision, and respective antipodal locations do not change over time, whereas, *antipodes* as a relative term, "describe the location of a place in relation to other human and physical features" (Fouberg *et al.*, 2012, p. 16). The antipodes as an absolute

term are exact and contemporary, and conversely the antipodes as a relative term are inexact and historical. Further, Antipodes as a relative term is evolving differently with meaning and usage, diverging temporally across hemispheres, and between generations operating within existing social-cultural-political milieus (J. Monk, personal communication, February 28, 2014).

Within the United States, a lesson on the antipodes would most align with the National Geography Standards 1 and 2. Here, the absolute and relative renderings of antipodes correspond, respectively, with standards: 1) How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information, and, 2) How to use mental maps to organize information about people, places, and environments in a spatial context (Heffron & Downs, 2012). In Australia, this topic meshes with the recent F-10 Australian Curriculum: Geography promoting the concept of space as being 1) about the significance of location and spatial distribution, and as, 2) perceived, structured, organized, and managed by people, and can be designed and redesigned, to achieve particular purposes (Maude, 2013). However, given that curricula evolve within the context of state rhetoric (Fastier, 2013) and national politics (Butt & Lambert, 2014) the antipodes will be discussed within the dichotomy of absolute and relative location/space rather than a specific national geography curriculum.

An important aspect of teaching is using appropriate examples to illustrate ideas and concepts (Center for Teaching and Learning, 1991). The following section positions the antipodes within the context of absolute and relative space with illustrations convenient for instruction.

Absolute

Calculating the Antipode of Figueres, Spain

Calculating a location's antipode is elementary, however, one suspects that uninitiated students would appreciate a primer (Landing, 1959). Therefore, the following is an example of how to calculate the antipode using the latitude and longitude of Figueres, Spain (42° 15' N, 2° 57' E). In Figueres, on a traffic island located in the historic center of town, there is a pole reflecting an image of Salvador Dali (Figure 2). On multiple levels this image affords fodder for antipodean musings. Salvador Dali (1904-1989) was a surrealist with a strange vision of art that still dazzles and mystifies aficionados. Here Dali's portrait, including his infamous mustache, is visible as a mirror-image (antipodal) reflection on the glimmering pole. Further, envision the pole piercing through to the opposite side of the Earth to its antipode. One would determine the antipode

of Figueres by following the four steps below. In this example the coordinates are given in degrees and minutes[3].

Figure 2. Salvador Dali's reflection on pole at Figueres, Spain, May 2013 (photo by first author).

STEP 1. Record the latitude and longitude of Figueres, Spain: 42° 15' N, 2° 57' E
STEP 2. Change the latitude to its antipodal location: 42° 15' S
STEP 3. Subtract the longitude 2° 57' from 180° 00'and change to opposite or antipodal direction (i.e., E to W): 177° 3' W
STEP 4. Combine the results from Steps 2 and 3 to get the antipode of Figueres, Spain: 42° 15' S, 177° 3' W

The antipode of Figueres, Spain, is located in the South Pacific Ocean just east of Wellington, New Zealand and, coincidentally, somewhat proximal to the Antipodes Islands Group, New Zealand (49° 40' S, 178° 46' W) (Geographic Names Information System, 2013). The juxtaposition of the International Date Line and circle of illumination arguably place Antipodes Island in first light of the recent millennium on January 1, 2000. This happenstance is an ironic coincidence of colonial toponymic hegemony rather than factors determining Earth-Sun geometry. The circle of illumination is the dividing line between day

3) Note that in the sexagesimal system there are 60 minutes in a degree and 60 seconds in a minute, so subtract accordingly in Step 3.

and night and its arrival coincides with sunrise. Therefore, if one were watching from Antipodes Island at a vantage point of 365 meters, calculations support a sunrise at 3:55 A.M. (New Zealand Standard Time), January 1, 2000 (Catchpole, 1997; Lechner, Blain, McWhirter, & Kristament, 1997). There were other competing places vying for the first sunrise award including New Zealand's East Cape, Tonga, Kiribati, and Antarctica, some of these with more or less justification (Royal Society of New Zealand, 1996).

Cartographic Applications

The antipode is a significant element in map projection and cartography (Dent, Torguson, & Holder, 2009). Projecting involves transferring the features from a globe to a plane (sheet of paper) or such otherwise flattenable surface (cylinder or cone) (Campbell, 1984). This is accomplished using a light source projecting onto a plane, cylinder, or cone that is in contact with or tangent to the globe. The illuminating light source can be positioned either at the center of the globe (gnomonic), antipode of the tangent point (stereographic), or at infinity (orthographic) (Figure 3). No projection is able to simultaneously maintain correct scale between distance, shape, direction, and area so distortion is inevitable (Kimerling, Buckley, Muehrche, & Muehrche, 2012). Using computer software, changing projections is possible "on the fly" and facilitates comparing distortions between alternative map projections (Wikle, 1991). Therefore, it is important to select the map projection that is appropriate for the intended use or application (Robinson, Morrison, Muehrcke, Kimerling, & Guptill, 1995).

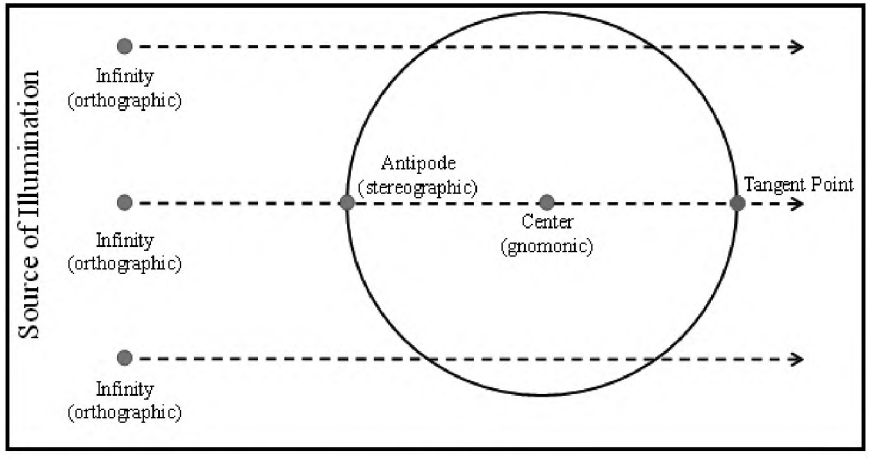

Figure 3. Sources of illumination: center, antipode, and infinity.

Projections illuminated or derived from the antipode (of tangent) are labeled stereographic. One of these is the azimuthal stereographic projection often used for navigating Polar Regions. In this instance the plane is situated over one of the poles. With the azimuthal stereographic projection in the polar aspect, parallels exist as small circles and meridians as straight lines. Parallels and meridians intersect at right angles and converge on the pole. Area distortion increases moving from the pole to the equator. Distortion at the edge of these azimuthal stereographic projections is so exaggerated that these just depict half the world. In this projection, direction between all points and the tangent or center point are true; however, direction is not valid between all other noncentral points (Dent *et al.*, 2009).

Kimerling (2002) addressed a real-world application of using the antipode for cartographically determining the *qibla* or direction of prayer. Muslims pray five times a day facing in the direction of Mecca. This direction varies for Muslims scattered around the world so it is an important problem to solve. Kimerling plotted Mecca and its antipode on a Mercator projection. He generated great circle lines (a great circle divides the globe into equal halves) emanating outward in 10 degree increments from Mecca to its antipode. The map allows one to determine the sacred prayer direction, or *qibla*, using the angle of intersection between a great circle drawn between Mecca and a local meridian (i.e., New York).

Geologic and Astronomical Illustrations

The use of antipode appears in physical geology often because seismic waves, both surface (S) and primary (P), travel to the opposite side of the world. S-waves travel from an earthquake's epicenter to its antipode as concentric rings of energy in successive back and forth cycles; whereas, P-waves that travel perpendicularly through the Earth can reach its antipode (Davidson, Reed, & Davis, 1997). Geologists also examine the magnetic fields of Earth and other planets. Earth's magnetic field has an antipodal flow from the south to the north magnetic pole (Davidson *et al.*, 1997). Recent geologic studies suggest a slight decrease from previously thought on seismic convergence at the antipode of a meteorite impact (i.e., Chicxulub) (Meschede, Myhrvold, & Tromp, 2011). For example, Korotkov (2009) calculated that no secondary antipodal explosion occurred in conjunction with the Tunguska meteorite explosion of 1908.

Contrary to the imagery implied in Pink Floyd's 1973 album *The Dark Side of the Moon* there is only a *farside*. Because the Moon's rotation and orbit are synchronized at 27.3 days, only one side is visible from Earth. The synchronized Earth-Moon orbit-rotation shields the farside of the Moon from radio frequency interference (RFI) from Earth. Maccone of the International Academy of Astronautics recommends that the United Nations recognize a Protected Antipode Circle (PAC) on the farside of the Moon (Maccone, 2008). This would be a 30° latitude by 30° longitude circle with a diameter of 1,820 km

centered on the Moon's antipode. RFI from Earth would be attenuated 100 decibels or greater within the PAC. Maccone also proposes establishing a Lunar Farside Radio Lab within the 80 km Crater Daedalus. The PAC and Lunar Farside Radio Lab would breathe "new life" in the science of radio astronomy (Maccone, 2008).

Relative Antipodes

Toponyms

Cultural geographers have an affinity for learning the toponyms and meanings of places. A Search for "Antipodes" in the USGS Geographic Names Information System (2013) returned just three place names outside the United States (Antipodes Islands Groups, Antipodes Island, and The Antipode Fracture Zone). The Antipodes Island Group is located off the coast of South Island, New Zealand (49° 40' 00'' S, 178° 46' 00'' E). The largest of this group is itself called Antipodes Island. The Antipodes Island Group forms the crest of the subterranean Antipodes Scarp, located within the Antipodes Fracture Zone (60° 00' 00'' S, 151° 00' 00'' W) (National Geospatial-Intelligence Agency, 2014), a significant undersea geologic structure of the south-west Pacific (Cullen, 1967).

Around the World in Eighty Days

Jules Verne's classic Around the World in Eighty Days (1990) is excellent supplemental reading for students in introductory geography courses and demonstrates linkages with literature (Albert, 2008; Caquard, 2011). While the protagonists Phileas Fogg and Passepartout circumnavigate the world, Verne weaves in physical and human geography elements from the geographic sub disciplines of geodetics, hydrology/oceanography, weather and climate, biogeography, transportation, ethnic studies, religions, geopolitics, and food. Further, as for geodetic references the following items appear: 50th parallel, 41st and 42nd parallels, Tropic of Cancer, Greenwich Meridian, 180th meridian, 101st W meridian, and, of special interest here, antipodes. The following quotes from Verne's (1990) Around the World in Eighty Days employ antipodes.

> *Docks, hospitals, wharves, a Gothic cathedral, a government house, macadamised streets, give to Hong Kong the appearance of a town in Kent or Surrey transferred by some strange magic to the antipodes* (94).

> *In which Passepartout finds out that, even at the antipodes, it is convenient to have some money in one's pocket* (115).

> *The General Grant passed, on the 23rd of November, the one hundred and eightieth meridian, and was at the very antipodes of London* (130).

The first two quotes refer to Hong Kong (22° 23' N, 114° 6' E) and Yokohama (35° 26' N, 139° 38' E) as being within the antipodes. Neither of these two cities of the Far East are antipodal to London (51° 30' N, 0° 7' W) the starting point for the globetrotting Phileas Fogg and Passepartout. Verne is using antipodes in these passages within a context of vernacular and relative speech to indicate a far off and distant region. The third quote locates the 180th meridian with respect to London, and by association, the Prime Meridian (0°), and therefore, references an opposite or antipodal meridian. One witnesses here a British-centric and colonial mindset that equates the antipodes with a number of far off distant and exotic locations irrespective of geodetic absolutes. Verne emphasizes, with these quotes, a singular point starting with London and multiple peripheral points all connoting antipodal locations, and perpetuating, all the while an imperial worldview.

Social Theory

Since 1969, radical geographers have been publishing in a peer-reviewed journal titled *Antipode*. Notice the singular form of the noun is employed to emphasize their focus on antipodal geographic perspectives. *Antipode* caters to alternative perspectives within academia with an emphasis on "how space, place, border, scale and landscape both shape and are shaped by unequal social relations" (Wiley Online Library, 2013). During the journal's long history, it has produced 1,690 articles (Google Scholar, 2013). *Antipode* was ranked number seven out of 27 geography journals listed in the ISI Journal Citation Reports for 2012 (AntipodeFoundation.org, 2013). Since 2007, *Antipode* has sponsored an international biennial Summer Institute for the Geographies of Justice to foster communication among critical social scientists. Even though none of the 12 geography textbooks (Table 2) explicitly recognized the term *antipodes*, two of the human geography textbooks (Domosh *et al.*, 2010; Fouberg *et al.*, 2012) included references from *Antipode*. Therefore, *Antipode* is influencing at least two of the surveyed human geography textbooks, and perhaps a more complete textbook survey would support numerous others references attributable to this impelling journal.

Global Scale Opposites

Surprisingly there are a number of rare and otherwise obscure words besides Antipodean for inhabitants or dwellers on opposite globe locations. There are other names for people distributed in an opposite fashion; these include Antoecian (opposite latitude), Heteroscian (temperate zones), Periscian (literally polar opposites!), and Perioecus (same latitude but opposite or different meridian) (Oxford English Dictionary Online, 2014). One might envision incorporating these terms, however obscure, as a novel framework for teaching and learning about latitude, longitude, parallels, and meridians, and of course antipodes (Table 3).

Table 3. Other global-scale opposites (Source: *Oxford English Dictionary Online*, 2014).

WORD	DEFINITION
ANTIPODEAN	Of or pertaining to the opposite side of the world.
ANTOECIAN	Of or belonging to the opposite latitude.
HETEROSCIAN	A name applied to the people of the two temperate zones in reference to the fact that, in the two zones, noon-shadows always fall in opposite directions.
PERISCIAN	An inhabitant of either of the polar regions.
PERIOECUS†	A person dwelling at the same latitude as another, but at the opposite or a different meridian.

(† = obsolete)

Conclusions

This exploration confirms that rather than being an obscure concept, the antipodes percolate across a diverse range of illustrations in mathematics, cartography, geology, astronomy, to cultural geography, literature, and social theory. These antipodal illustrations were organized under the concept of absolute and relative location as the term expresses divergent meanings. The authors rediscovered that antipodes, as a geographic concept, still abound even with its current lack of exposure in the introductory undergraduate curricula. In fact, as this piece ends, more and more instances of antipodal happenings vie for attention—there is something abuzz about an antipodal magnetism mystery on the moon (Air & Space Smithsonian, 2013)! So the saga continues. The authors realize that the term "antipodes" is not a staid geographic factoid, but one that traverses a broad spectrum of phenomena. Our hope is that our efforts, herein, reposition antipodes as a worthwhile geographic concept, nuances and all, and integral to geographic literacy. Our discourse supports reclaiming the antipodes for their geodetic value within the undergraduate introductory geography curriculum, but stresses sensitivities when using relative connotations in social, cultural, and political arenas. Caution is advised in using antipodes and antipodean in the relative context of marginalizing one place (Australian and New Zealand) from another (Britain). In this sense, these words represent a moving target with meanings diverging regionally, historically, and generationally, so beware of offending cultural sensitivities. Are there other outdated geographic terms that warrant scrutiny? Almost 100 years ago, Zonia Baber (1920) suggested renaming the solar circles (Tropic of Cancer, Tropic of Capricorn, Arctic Circle, and Antarctic Circle) with germane titles. Needless to

say her proposal fell on deaf ears; however, it is interesting to contemplate "that some terminologies have persisted, yet others fade and to ask how they come into being and why some change while others do not" (J. Monk, personal communication, February 28, 2014).

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References

Air & Space Smithsonian. (2013). The moon's antipodal magnetism mystery. Retrieved from http://blogs.airspacemag.com/moon/2013/06/the-moons-antipodal-magnetism- mystery/

Albert, D. P. (2008). Around the world in eighty days: Observations, omissions, and oddities. *The Geography Teacher*, 5(1), 4-8.

Albert, D. P., Morris, N. S., & Tiller, J. (2014). International Date Line: Time travel made easy—The Sequel. *The Pennsylvania Geographer*, *52*(1), 67-88.

Allison, J. (2009). *The sisters antipodes*. Boston: Houghton Mifflin Harcourt.

Antipode Foundation. (2013). About the journal and foundation. Retrieved from http://antipodefoundation.org/about-the-journal-and-foundation/a-radical-journal-of-geography/

Baber, Z. (1920). A proposal for remaining the solar circles. *The Journal of Geography*, *19*(7), 245-249.

Bacon, R. S. (1979). Building a curriculum in introductory human geography through core concepts. *Journal of Geography*, *78*(4), 152-156.

Bacon, R. S., & Green, J. E. (1981). Core concepts in introductory physical geography. *Journal of Geography, 80*(3), 104-108.

Belthuis, L. (1950). Map knowledge for grade school geography teachers.

Journal of Geography 49, 99-102.

Bergreen, L. (2003). *Over the edge of the world: Magellan's terrifying circumnavigation of the globe*. New York: Harper Collins.

Butt, G., & Lambert, D. (2014). International perspectives on the future of geography education: An analysis of national curricula and standards. *International Research in Geographical and Environmental Education*, *23*(1), 1-12.

Cambridge English Dictionaries Online. (2014). Cambridge University Press. Retrieved from http://dictionary.cambridge.org/dictionary/american-english/

Campbell, J. (1984). *Introductory cartography*. Englewoods Cliffs, NJ: Prentice Hall.

Caquard, S. (2011). Cartography I: Mapping narrative cartography. *Progress in Human Geography*, *37*(1), 135-144.

Catchpole, R. M. (1997). The start of the new millennium. *Information leaflet no. 29*. Royal Greenwich Society.
Retrieved from http://www.oarval.org/new_mill.htm

Center for Teaching and Learning. (1991). *Teaching at Carolina: A handbook for instructors*. Chapel Hill, NC: University of North Carolina at Chapel Hill.

Cullen, D. J. (1967). The Antipodes fracture zone, a major structure of the South-west Pacific. *New Zealand Journal of Marine and Freshwater Research*, *1*, 16-25.

Davidson, J. P., Reed, W. E., & Davis, P. M. (1997). *Exploring Earth: An introductory to physical geology*. Upper Saddle River, NJ: Prentice Hall.

Dent, B. D., Torguson, J. S., & Holder, T. W. (2009). *Cartography: Thematic map design* (6th ed.). New York, NY: McGraw-Hill.

Domosh, M., Neumann, R. P., Price, P. L., & Jordan-Bychkov, T. G. (2010). *The human mosaic: A cultural approach to human geography* (12th ed.). New York: W. H. Freeman and Company.

Edson, E. (1999). *Mapping time and space: How medieval mapmakers viewed the world.* London: The British Library.

Farnham, A. W. (1906). The geography course in the Oswego State Normal and Training—Part I. *Journal of Geography, 5*, 49-66.

Fastier, M. (2013). Curriculum development in New Zealand: New directions, opportunities and challenges for school geography. *Review of International Geographical Education Online, 3*(3), 241-252.

Fouberg, E. H., Murphy, A. B., & de Blij, H. J. (2012). *Human geography: People, place, and culture* (10th ed.).Hoboken, NJ: John Wiley & Sons.

Geographic Names Information System. (2013). Reston, VA: U.S. Geological Survey. Retrieved from http://geonames.usgs.gov/index.html

Goldie, M. B. (2010). *The idea of the Antipodes: Place, people, and voices*. New York: Routledge.

Google Scholar. (2013). Search "Antipode." Retrieved from http://scholar.google.com/

Heffron, S. G., & Downs, R. M. (2012). *Geography for life: National geography standards*, second edition. Washington, DC: National Council for Geographic Education.

Hiatt, A. (2008). *Terra Incognita: Mapping the Antipodes before 1600.* Chicago, IL: University of Chicago Press.

Hobbs, J. J. (2009). *World regional geography* (6th ed.). Belmont, CA: Brooks/Cole.

Jeal, T. (2007). *Stanley: The impossible life of Africa's greatest explorer*. New Haven, CT: Yale University Press.

Kimerling, A. J. (2002). Cartographic methods for determining the qibla. *Journal of Geography, 101*, 20-26.

Kimerling, A. J., Buckley, A. R., Muehrcke, P. C., & Muehrcke, J. O. (2012). *Map use: Reading, analysis, interpretation*. Redlands, CA: Esri Press Academic.

Korotkov, P. F. (2009). On the possibility of a secondary explosion in the

antipode of a large meteorite impact point. *Solar System Research*, *43*(4), 364-369.

Landing, J. (1959). Fundamentals in modern geography. *Journal of Geography*, *58*, 199-204.

Lechner, P. D., Blain, P. A., McWhirter, N. D., & Kristament, I. S. (1997). An assessment of where people will witness the first sunrise of the new millennium. *The Geographical Journal*, *163*(3), 251-258.

Loughlin, J. (1907). Antipodes. *The Catholic encyclopedia*. New York: Robert Appleton Company. Retrieved from http://www.newadvent.org/cathen/01581a.htm

Lutgens, F. K., & Tarbuck, E. J. (2001). *The atmosphere: An introduction to meteorology*. Upper Saddle River, NJ:Prentice Hall.

Maccone, C. (2008). Protected antipode circle on the Farside of the Moon. *Acta Astronautica*, *63*, 110-118.

Macquarie Dictionary Online. (2014). Macmillan Publishers Group Australia. Retrieved from http://www.macquariedictionary.com.au/

Maude, A. (2013). The vision of geography underlying the Australian Geography Curriculum. *Review of International Geographical Education Online*, *3*(3), 253-265.

Meschede, M. A., Myhrovold, C. L., & Tromp, J. (2011). Antipodal focusing of seismic waves due to large meteorite impacts on Earth. *Geophysical Journal International*, *187*, 529-537.

Monk, J. J., & Liepins, R. (2000). Writing on/across the margins. *Australian Geographical Studies*, *38*(3), 344-351.

Morris, N., Albert, D. P., & Tiller, J. (2010). International date line: Time travel made easy. *The Pennsylvania Geographer*, *48*(1), 100-114.

National Council for Geographic Education. (1911). College students' knowledge of geography. *Journal of Geography*, *10*, 304-305.

National Geospatial-Intelligence Agency. (2014). GeoNames Search. Retrieved from http://geonames.nga.mil/ggmagaz/

Oxford English Dictionary Online. (2013). Oxford University Press. Retrieved from http://www.oed.com/view/Entry/8784?redirectedFrom=antipode

Raisz, E. (1948). *General cartography*. New York: McGraw-Hill Book Company.

Robinson, A. H., Morrison, J. L., Muehrcke, P. C., Kimerling, A. J., & Guptill, S. C. (1995). *Elements of cartography* (6th ed.). New York: John Wiley & Sons.

Royal Society of New Zealand. (1996). McWhirter backs Chathams for dawn of new millennium. Retrieved from http://www.royalsociety.org.nz/1996/06/26/mcwhirter-backs-chathams-for-dawn-of-new-millenium/

Thrower, N. J. (2007). *Map & colonization: Cartography in culture and society* (3rd ed.). Chicago: University of Chicago Press.

Verne, J. (1990). *Around the world in eighty days*. New York: Tom Doherty Associates, LLC.

Warman, H. J. (1970). Globalism: A concept and its development. *Journal of Geography*, *69*(1), 6-17.

Wikle, T. (1991). Computer software for displaying map projections and comparing distortions. *Journal of Geography*, *90*(6), 264-266.

Wiley Online Library. (2013). Antipode: A Radical Journal of Geography. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-8330

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