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Heavenly Bodies

Scientific racism and the taxonomy of extraterrestrial life

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Abstract

In recent years postcolonialism has shifted from exploring the occidental construction of the orient to exploring the role of the occident's colonial other, the orient, in these constructions through the act of hybridity; that is, the influence that real colonial others have on Orientalizing discourse. But what if the literal existence of the other being analyzed cannot be substantiated. Through an analysis of various scientific constructions of extraterrestrials, such as the inhabitants of the moon described by Johannes Kepler or the description of faraway alien races by Ronald Bracewell, this essay examines how the methods of otherizing practiced on creatural populations whose existence is believed but unsubstantiated, others for whom hybridity is impossible, are then applied to real colonial subjects. Mirroring the role of the medieval Plinian races of India and Africa in providing a mythical structure for the construction of race during early capitalist expansion in South America, modern extraterrestrials have provided a mythical structure for the construction and maintenance of racialized others.

Keywords: Orientalism, Postcolonialism, Hybridity, Extraterrestrial Intelligence, Exobiology.

Introduction

Simpson (1964) famously characterized astrobiology as 'a science that has yet to demonstrate that its subject exists'. Nonetheless, scientific discussions of extraterrestrial life have not only provided varied descriptions of life on other worlds but also differentiations between forms of extraterrestrial life, proving itself vulnerable to the same taxonomic obsession with categorizing life Foucault (1970) famously described as pervading the formation of the natural sciences. Often these schemas for understanding life on other planets appear innocuous, for instance, the three-tiered classification (type I-III civilizations) developed by Kardashev (1967), which sorted extraterrestrial civilizations by their ability to harness energy, or later by Sagan (1973), which categorized planets based on the amounts of information they can communicate. Such hierarchical categorizations of extraterrestrial life appear as little more than attempts to solve the technical problem of establishing contact with extraterrestrial life. Yet, viewed genealogically, these hierarchical schemas are married to historical interconnections between racialization of indigenous peoples and speculative typologies of alien lifeforms. When viewed through this history, the colonial undertones of recent attempts to categorize life on other worlds, and its connection to policies of racial oppression, become evident.

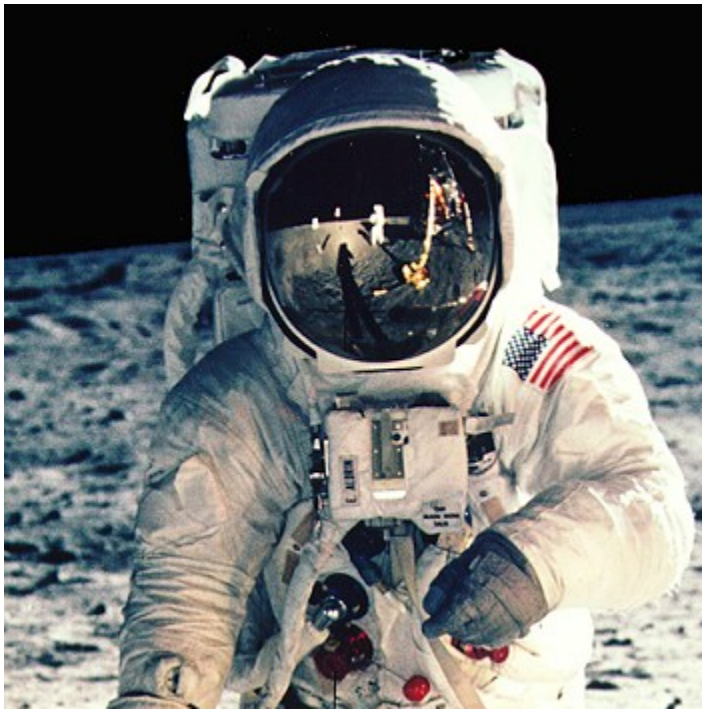

Figure 1

Aldrin Poses for Portrait, Apollo 11 Image Gallery (AS11-40-5903).

The following essay provides a brief genealogical description of the discussion of extraterrestrial life. Early discussions are closely linked with the modes of thought indicative of colonialism. When astronomers look out into space, they find difference, hierarchy, and biological determinism. But, the logic used to examine life in space does not remain in space. There are, instead, constant slippages, moments where the terrestrial and the extraterrestrial are conflated. It is in these slippages where the allegorical function of extraterrestrial life is identified. Behind the extraterrestrial, this unidentifiable subject of science, it is seen there are real human beings, colonial subjects, obfuscated to a trace by projections of the colonial subject into space.

In Todorov's (1984) classic study of 'the discovery self makes of the other', he justifies using European conquistadors as self and the native peoples of Mexico as other through a series of comparisons to other historical moments of colonization. Taken together Todorov displays that the 'most astonishing encounter' of the colonization of Mexico constitutes 'radical difference' par excellence. Included in these comparisons is a justification for why the Apollo

11 moon landing does not constitute an interaction with radical difference. That:

> the moon is farther away than America from Europe, true enough, but today we know that our encounter with it is no encounter at all…for a living being to be photographed on the moon, an astronaut must stand in front of a camera, and in its helmet we see only one reflection, that of another earthling. (Todorov p. 4)

In space one does not interact with a real, living, breathing, human other but a reflection of oneself, an encounter that turns out to be 'no encounter at all'. In recent years, postcolonial theory, following Bhabha (1994), has focused on the role of colonial others to contradict the racialized discourse which accompanied colonialism, a discourse which possess continued relevance for alterity globally. By their mere existence, colonial others confront discourse. Irreducible to its judgements they display the internal ambivalence of European notions of civilization. No civilization is reducible to Western notions of the primitive, so when European powers treat colonial subjects as primitives, they display that they are not civilized and that political order built upon democratization and liberalism is simultaneously built upon the purposeful exclusion, and sometimes eradication, of most of humanity. Thus, on the borderland of Western discursive regimes, in the moments when its discourse meets colonial subjects, a subversion occurs. The discourse is affected, hybridized, by its other. Despite the influence of power and the oppression of local understanding by the spread of Eurocentric ideation, the interaction between western and local discourse is not unidirectional. Colonial discourse is affected, and ultimately challenged, by the very people, places, and ideas it seeks to subjugate. Yet, colonial discourse is not defenseless against this subversion. It seeks to arrest the space of hybridity. Through racialization or stereotyping, the discourse can develop preconceptions capable of overcoming the other's real existence and of overwriting their materiality with its own pronouncements. Within this frame the idea of mythical alterity, developed in this essay, is a specific strategy of capture. Beyond the borderland, deep in the terra incognita of colonial discourse, others are formed who are incapable of hybridization—others who are removed from human experience but nonetheless shape our experience of otherness; who occupy imagined realms but nonetheless are given an air of factuality and are

structured as real. It is the image of a being refracted in the helmet of the astronaut and the West's closed discourse with itself through its self-constructed image of the other.

Historically, mythical alterity is both antecedent and predicate to real colonial otherness. It is seen in Plinian races and fantastical travel literature of the middle ages reanimated during the conquest of the Western hemisphere (Braham, 2015; Campbell, 1988; Greenblatt, 1991; Magasich-Airola and de Beer, 2007). They were 'utilized to turn living Indians into symbols…the erasure of which is murder' (Campbell, 1988, p. 86). Thus, the indigenous people of two continents were transformed into Amazons and Anthropophagi as the landscape they occupied was transformed into Eden and Eldorado; the mixture of fear and greed elicited literal and cultural destruction on a genocidal scale.

Why were the symbols of alterity, originally developed as free projections of mediaeval Europe to describe the unexplored Asian continent, so transmutable to the Western hemisphere? In Greenblatt's (1991) discussion of the utilization of Mandeville's Travels during early contact with the Caribbean, he notes Mandeville's 'wonder and admiration' for Chinese paper money. Coinage stamped from metal wears through circulation, each hand it passes through infinitesimally stripping gold or silver until the coin's value is lost. Paper money's value, on the other hand, is purely symbolic. The signs printed upon it are left undiminished by transfer. This description bears a striking resemblance to Mandeville's narrative, itself 'a representation of the external world that does not so much depend upon as call into being an external reality, a self-authorizing, self-authenticating representation that cannot be falsified or diminished in value through circulation' (pp. 37-38). The narrative's lack of materiality, that is its lack of connection to physically existent human beings, gives it exchange value. It becomes widely applicable to people in different times and places, each time failing to be completely falsified or diminished in its explanatory power. Aren (1979) describes a similar myth surrounding cannibalism with the transposition of the Anthropophagi, or cannibal, from one geographic location to another (Asia, South America, Africa, Papua New Guinea) as each is subsequently identified discursively as the extreme human Other. In each movement, the myth of cannibalism is left untarnished and equally believable.

In the above examples one can see the double sense in which mythical alterity is mythical. It is both mythical in an everyday sense, as in it is removed from experience. The East for medieval and early modern Europeans was a world told to them in rumors and beyond their comprehension, accounting for the fantastical images they believed. But it is also mythical in a semiotic sense. It provides second-ordered signification, a form into which significations of specific others can be ordered and systematized. Mythical alterity, in its lack of connection to the material, provides a generalizable framework which can be reapplied across time and space to arrest the state of hybridity and allow colonial discourse the power to silence materially existent human beings.

Mythical alterity not only can be applied to different places—it must. It gains its power from its distance and from its lack of hybridity. Amazonians can be in the East only if the East is not comprehended. The presence of real people on the subcontinent of Asia, people who are in fact not Amazonians, question the Amazonian's existence. They can be translocated to South America but only in so far as South America is remote enough to avoid hybridization, at which point this specific mythical alterity dies out (Amazonian tribes), or it translocates again (as the Anthropophagi moves to Africa and South Pacific). This is the reason why, as Nicholson (1948) already explored in Voyages to the Moon, scientific interest in space is interconnected with colonization. As the world became mapped and known the Western appetite for places that 'reflect both the terror and fascination of the unknown stretching beyond man's knowledge but not beyond his fancy' turned upon the skies (p. 7). From the perspective of mythical alterity, the question is how can we understand this expansion into outer space as the maintenance of colonial alterity? Where do we find slippages between the alterity of aliens and colonial subjects? At what point do mythical others begin to blur with real colonial and postcolonial subjects?

To begin answering these questions the following essay closely examines the way extraterrestrial life is imagined and categorized at various points in modern astronomy. Particular attention is paid to any slippages between the extraterrestrial and the terrestrial, when the rhetoric of otherness, utilized to justify the territorial and economic expansion of Western nation states, is applied to extraterrestrials or, conversely, where discussions of difference among extraterrestrials or between extraterrestrials and human beings are

reapplied to understand racialized forms of difference here on earth. These examinations begin with Johannes Kepler (2018; 1965) who theorized differences among inhabitants of the moon at the beginning of Western colonialism and Immanuel Kant (2008) who theorized the different planetary beings within our solar system at the dawn of scientific racism. This essay then examines the heightening of racial differences in Richard Locke's (1859) moon hoax during the heyday of colonial expansion and ends by displaying the perpetuation of colonial difference-making in two examples taken from the astrobiology of the 20th century, the work of Ronald Bracewell (1974) and the panspermia movement (Arrhenius 1907; Crick and Orgel 1973; Hoyle and Wickramasighe 1978). Taken together, the examples display the conflation of real and imagined, terrestrial and extraterrestrial, otherness and the self-perpetuation of colonial racial discourse beyond the hybridity of real colonial others.

Kepler, Herschel, and the Two Faces of the Moon

At the beginning of modernity, the creation of taxonomies for extraterrestrials displays a clear link to the nascent racialization of human beings. Before scientific racism in the 19th century, Kepler's (2018 [1634]) Somnium, a fictionalized reprisal of his dissertation, developed a schema for intelligent life on the moon that not only conflates cultural and biological differences but ties those differences deterministically to a physical geographic location. Even before discussing the moon, Somnium is steeped in terrestrial alterity. Duracotus, the story's Icelandic protagonist, is 'a semi-barbarian on account of …birthplace and indigent circumstances', who comes to study astronomy with Tycho Brahe after he is sold into slavery by his mother, a witch who supplies passing merchant ships with 'herbal concoctions' (pp. 10-11). After curiosity leads him to open one of these concoctions, which is unknowingly already sold to a skipper, Duractus is offered as payment. Later, upon returning to Iceland, Duracotus' mother summons a daemon who magically transports Duracotus to the moon.

Thus, at the onset of the narrative, Kepler is creating a 'savage' atmosphere for Somnium. Beyond the connection with paganism present in his mother's witchcraft, in the late 16th century, a northern passage to Cathay was actively being explored. Popular accounts of sea voyages in the North, such as Hakluyt's (1972 [1589]) Voyages and Discoveries, relayed to Europe's literate audience tales of harsh and wild landscapes, uninhabitable but occupied with strange and hitherto unseen animals. Duracotus' 'semi-barbarian' origins and mystical associations, especially in contrast to the scientific aims of the essay, gives him an aura of primitiveness which literally gains him access to the even more foreign beings on the moon via a demonic apotheosis.

Once on the moon, Duracotus observes that the lunar landscape is divided into distinct binary hemispheres separated by astronomical differences. Most significant, each hemisphere's day and night are six months long, just as in Duracotus' homeland, also noted by Kepler, but harsher (p.10). What differentiates the hemispheres is the earth's reflection of the sun. Where in one hemisphere the six-month night is in constant darkness in the other the rays of the earth shines upon them moderating the extremes of the seasons. Corresponding to these hemispheres are two distinct groups of extraterrestrials with physical and cultural characteristics determined by their global position on the moon. The Privolvans occupy the harsher landscape. They, 'have no fixed dwelling' and 'traverse the whole of their world in hordes following the receding waters either on legs that are longer than our camels, on wings, or on boats'. By contrast, the Subvolvans, occupying the more pleasant hemisphere, live in places that 'resemble our cantons, towns, and gardens' (p. 29). In Conversation with Sidereal Messenger, Kepler (1965 [1610]) provides more details about the Subvolvans, that 'being endowed with very massive bodies they construct gigantic projects' building 'a sort of underground city' out of a large circular embankment they use to escape the sun of the long summers. They build 'their homes in numerous hewn caves out of that circular embankment' and 'place their fields and pastures in the middle to avoid being forced to go too far away from their farms in their flight from the sun' (p. 28).

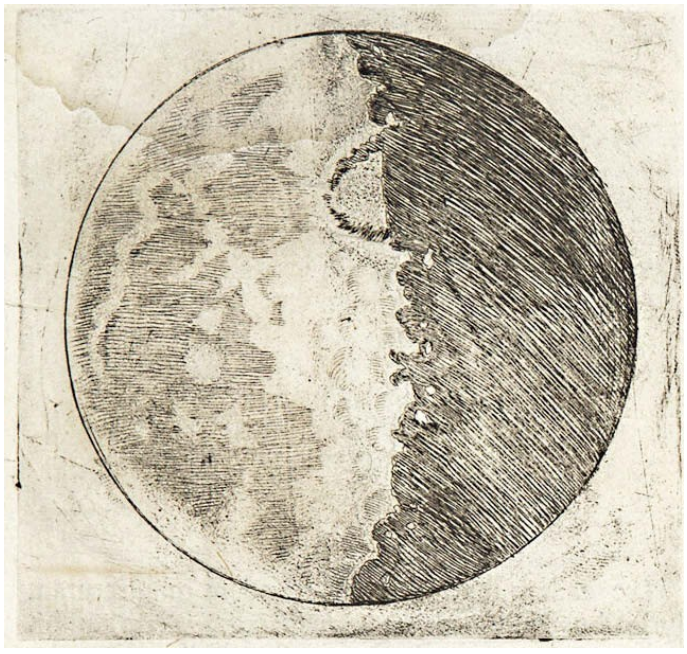

Figure 2

Galileo's (1610) Sidereus Nuncius.

Here one sees Kepler using a binary distinction of primitive and civilized that corresponds to nomadic and settled peoples, a dichotomy Western Europe inherits from Herodotus and others in the ancient and medieval world (Hartog, 1988). But one also sees that this division is no longer driven by cultural or religious differences, as it was historically. Instead, Kepler identifies geographic differences which translate, conflated, into physical and cultural differences. Here Kepler implies a logic not yet fully applied to human beings, not until the natural historians and evolutionary biologist who construct the scientific theory of race over a century later. In the 19th century, Kepler's hemispheric thinking is again applied by Herschel (1969 [1834-1838]) to Earth. In the journals from his expedition to South Africa to observe the southern sky, he describes how, in the 'change of hemisphere all the conventions of things become bouleversees—top becomes bottom and left becomes right' (p. 29). Later, when he notes differences of the moon in South Africa and that of his native England, the innocuousness of this world-turned-upside-down description of the hemispheres fades:

> The full moon as it rises presents a round, dull blotchy human face, with a broad nose sulky mouth and standing perpendicularly has just the effect of some preternatural being—Demon-or-god of some barbarous nation looking down on his African territory and sniffing with sullen pleasure the scent of some bloody right or looking down on the whole region as a scene of carnage agreeable to his nature and will. The European face is quite lost by the reversal of its position. (p. 49)

Symbolically, Herschel employs the same merger of differences (astronomic, environmental, cultural, physiological) as was present in the lunar peoples observed by Kepler. It is as if, in the time between Herschel and Kepler, the discourse of alterity moved. When Kepler looked to the sky, he projected an alterity, civilized and nomadic, worn thin from its application to increasing diverse and geographically distant peoples. In Conversations, Kepler often creates parallels between astronomy and early colonialism. He compares Galileo to Columbus; his 'visual experiences' are akin to 'the discovery of the new world' where previous astronomers' 'theoretical speculation' resembles 'Ptolemy's discussion of the antipodes' (p. 17). Later, he predicts the colonization of alien races claiming:

> It is not improbable that there are inhabitants not only on the moon but Jupiter too […] but as soon as somebody demonstrates the art of flying, settlers from our species of man will not be lacking […] given ships or sails adapted to the breezes of heaven, there will be those who will not shrink from even that vast expanse (p. 39).

Conversely, as Herschel stares up at the moon from his landed estate established in the southern hemisphere, Kepler's alterity returns to him. It travels from the moon, where Kepler has placed it, and falls back to earth.

Kant, Jovians, and 'Hottentotes'

Similar slippages between terrestrial and extraterrestrial schemas of taxonomy are present in Universal Natural History and Theory of the Heavens, where Kant (2008 [1755]) famously developed the nebular hypothesis of planetary formation, in which planets had their origin in the sun and migrated further into the solar system as they aged. In the final chapter of the text, Kant develops a natural history of beings on other planets in comparison to humans on earth.

Central to Kant's taxonomy is a relationship between 'the distances of celestial bodies from the sun' and 'the different characteristics of the thinking natures found on these very bodies' (p. 130). Some extraterrestrial beings closer to the sun, closer to the place of their planetary origin, have a 'cruder structure' which makes them 'sluggish' allowing them to endure the heat of the sun without 'the scattering and drying up of their fluids and violent tensions in their fibers'. Conversely, beings farther away from the sun 'consist of far lighter and more volatile material' and through 'the elasticity of their fibers as well as the advantageous construction of their design must be more perfect in proportion to their distance away from the sun' (p. 137). This basic difference in material construction through celestial location identifies that newer planets (i.e. Venus) possess entirely physical beings, while older planets (i.e. Jupiter) possess entirely cerebral and spiritual beings. The earth, caught in the middle, possesses a mixture of the two. As a result, human beings are 'among all living things the poorest at realizing their purpose'. They are caught between the spiritual and the physical, the 'stuff and fabric of the constitution of human nature is the cause of that lethargy which keeps the soul's capabilities continually weak and powerless' (p. 135).

This represents a concept of space and time, or more aptly a conceptual confusion, matching what Fabian (2002) describes as the 'denial of coevalness'. Largely through evolutionism, colonial discourse intertwined concepts of 'there' and 'then'. By denying the gleichzetigkeit (simultaneity) of others from 'there', they are exiled to the past, rendering them insignificant in the present. They simply become a survival from a moment of the western subjects own past, from a different stage in the West's evolution. We see in Kant's discussion of extraterrestrials this colonial logic heightened. The Venusian are placed in Earth's literal past physical position; that is, the exact location from the sun humans once occupied. But Kant's theory also bars Venus from taking part in this physical plane. Earth is too volatile and light for their sluggish flesh. This planet would certainly lead to their death. Thus, this largely symbolic relocation to the past for truly existent human beings can be transformed into a literal denial of coevalness. With extraterrestrial life Kant's denial can be more extreme, a denial which would immediately be threatened by real living beings who assert their coevality, not only through their

coexistence in time and space but also in their failure to correspond to the western historical past and evolutionary projections for them.

Unlike the hierarchy Kant creates for races on the earth, with white Europeans representing the most evolved population, humans are not in the position at the top of this interstellar evolutionary chain. They are simultaneously exiled from the angelic-like state of the Jovian, a future they cannot yet obtain. This explains Kant's somewhat disdainful tone in describing human beings in Universal Natural History and Theory of the Heavens. The passage on extraterrestrial life begins with an analogy comparing humans with lice on a beggar's head who 'had for a long time thought of their dwelling place as an immeasurably large ball and themselves as the masters of creation', until, 'a Fontenelle of his species…unexpectedly learned about a noblemen's head' (p. 132). His choice of the beggar for humanity in opposition to the noblemen for extraterrestrials is telling. It points to the hopeful contradiction of evolutionism; that while the West places itself at the top of an evolutionary scheme, civilization is, nonetheless, incomplete. Future generations will benefit from further progress, both socially and physiologically, and will therefore surpass present western civilization. Evolutionism is ironically self-aggrandizing and self-abasing—a collage of arrogance and paranoia.

After finishing this taxonomy of extraterrestrials, quoting from Alexander Pope's 'Essay on Man', Kant spills the bounds of the extraterrestrial, placing human racialization in the middle of his celestial taxonomy. On the side of Venus, we have 'creatures among whom a Greenlander or Hottentot would be a Newton', but, to the inhabitants of Jupiter, 'we have people who would admire Newton as if he were an ape'. Here Kant exhibits the West's place in this taxonomy where the angelic-like state of the inhabitants of Jupiter becomes a utopian vision of its future insured only through their exclusion of colonial others (Venusian, 'Hottentot', Greenlander, etc.) who can only gaze upon the exultant Westerner with the same anticipation. In its processes of democratization, liberalization, and enlightenment, the West finds itself in the present, an instable and changing place between promise and fulfillment. Our sluggish past is behind us but the 'more perfect…advantageous construction of [our] design' awaits us (pp. 137-138). This hope is tied to dissociation with our own 'then' which, within its confused conceptual apparatus, necessitates a

simultaneous disavowal of 'there'. Without the 'Hottentot' being considered closer to ape than Europeans, the West could not be assured of its own Jovian future.

This learned dissociation from the coeval-other-as-past is not limited to Kant's (2000 [1777]) work on extraterrestrials but is present in his On the Different Human Races, often considered a founding text of scientific racism, published over twenty years later. There are remarkable similarities in logic between his schemas for extraterrestrials and for human races. While extraterrestrial difference depends on the planet's position in relation to the sun and the resulting temperature difference, terrestrial racial differences are dependent on temperature and moisture caused by peoples' physical proximity on the earth. Migrating from what Kant identifies as the origin point of humanity (31-52 degrees latitude), the different races represent adaptations to temperature and moisture from the 'lineal root', the original genus of mankind which is white in skin color with brown hair. The first alteration, which Kant calls 'noble blond', is caused by migration to the northern regions of Europe (noble blond-first race-cold/humid). From there, human beings migrated to the Americas (copper red-second race-cold/dry), to Africa (black-third race-humid/heat), then finally to Asia (olive yellow-fourth race-dry/heat). Within Kant's schema each race represents a deviation and, in so far as they cannot reproduce the lineal root on their own (all subsequent races except 'noble blond'), they represent racial 'degeneration'. Furthermore, since races are perfectly adapted to their environment, they can 'perpetuate themselves in all regions of the earth' only because of interbreeding, because they obtained traits of other races (p. 9). But, for Kant, this inevitably reduces the fitness of the now hybrid race to its original environment, a problem Kant sees as particularly true of interbreeding between White and Back races. Thus, we see in Kant the same logic (physical proximity and temperature) governs the natural history of human beings internally (in comparison with one another) and externally (between ourselves and intelligent life on other planets).

Yet, we see between the two an inversion. As races move away from their point of origin, they devolve, degenerate, lose their original integrity through the mutagenic effects of heat and humidity. As planets move away from their point of origin, the sun, the beings inhabiting them gain superior structure. The

question is, with both schemas built upon the same logic, why is there a shift to racial degeneration in On the Differences of Human Races rather than continuing the evolutionary progressive outlook of Universal Natural History? Although in both cases Kant questions the ability of races to live in each other's environment, the existence of real representatives of other races transgressing the boundaries of Kant's constructs threatens his geographical separation. The Jovians and Venusians cannot migrate from one planet to another, so their distinction remains abstract; they are clean and pure rational categories. Kant shifts to the theme of degeneration and impurity in an attempt to clearly delineate racial categories. In other words, the shift from positive evolution, Kant's evolution of extraterrestrials, to an evolution of racial degeneration, his evolution of human beings, represents the breakdown of his racial schema in its purest form to one that must actively be preserved and protected if the real bodies of human beings are not to render it meaningless and arbitrary. This explains Kant's specific concern with interbreeding, with 'half-breed' humans who can spread across the globe. Read this way, Kant's theory is not the promotion of monogenesis, as is often claimed, but the preservation of polygenic categories despite monogenesis. It is a way to hold on to the separate origins of races and preserve its racial categories despite the contradictory evidence of the migration and racial mixing. The fact that this degeneration thesis contradicts the clear, evolutionary, future-oriented philosophy of Universal Natural History only makes Kant's natural history, taken collectively, a clearer embodiment of colonial ambivalence. It represents what will become the nationalism and separatism of apartheid (degredationism) as well as the universalist expansionism of the French mise en valeur (evolutionism) which sought to civilize colonial subjects. Taken together Kant uses the former to protect the later, finding comfort in colonial contradiction.

The Moon Hoax, Trekboers, and the Galactic Safari

Locke's (1859) 'Great Astronomical Discoveries Lately Made by Sir John Herschel at the Cape of Good Hope', originally published in a series of The New York Sun articles beginning on August 25, 1835, serves as another example of the blurred line between terrestrial and extraterrestrial, colonial

and mythical, alterities. These articles present what the author claimed as a new discovery by John Herschel at the Cape. Although Locke fabricated it to mock American intellectuals who were prepared to quickly accept reports of extraterrestrial life, the general public's willingness to embraced Locke's hoax displays its relevance to the era's discourse. Even the real Margaret Herschel commented on her husband's reaction to the hoax, identified its believability and claimed that they only wished the article were true (Herschel, 1969, pp. 236-237). Any alterity in Locke's narrative can therefore be considered a reflection of Western attitudes towards space and extraterrestrial life.

Locke's hoax displays the blurring of the colonial and mythical in South Africa's prominence in the text: the 'Cape of Good Hope' even appears in the article's title. Thus, the fact that this fictionalized Herschel in Locke's text makes astronomical observations from the African continent draws the same connection between terrestrial and extraterrestrial alterity as was seen in Kepler's protagonist having been from Iceland. When Locke describes Herschel's excursion beyond the Table Valley to construct his telescope, the text immediately ties this scientific exploration to African settler colonialism. His 'ascent to the plains' is aided by 'two teams of oxen, 18 each'; 'The erection of his giant fabric' is 'aided by several companies of Dutch Boers' (p. 18). With the introduction of 'oxen' and 'companies of Boers', Locke weaves Herschel into the imagined world of settler colonialism through the mythology of Trekboers and Vortrekkers taming the wilds of Africa via oxcart, a mythology which, to this day, is a prominent symbol of White nationalism in South Africa (Moodie, 1974).

The same connection is seen in Locke's parallels between astronomy and hunting. When we join Herschel at his telescope to peer through the lens, we are presented with a sort of cosmic safari, discovering one animal after another, most of which can easily be associated with the West's internal or external periphery. First, there is a 'continuous herd of brown quadrupeds, having all the external characteristics of the bison'. Then Herschel spots an 'antelope' that 'would be classed on earth as a monster…a bluish lead color, about the size of a goat…and a single horn, slightly inclined forward from perpendicular' (pp. 21-26).

After briefly examining an island of waterfowl and a 'strange amphibious creature of a spherical form', one is presented with the narrative's first sign of humanoid life, which:

> Resembles the beaver of the earth in every other respect than the destitution of a tail, and its invariable habit of walking upon only two feet. It carries its young in its arms like a human being, and moves with an easy gliding motion. Its huts are better constructed than most human savages, and from the appearance of smoke in nearly all of them, there is no doubt of its being acquainted with fire (pp. 27-31).

The description of these 'savages' is strangely reminiscent of polygenesis theories of race. The 'beaver' humans are obviously originating form a source different from humans on earth and, as we will see, other humanoid creatures on the moon, but they nonetheless resemble human beings in a variety of ways: walking upright, cradling their infant children in their arms, constructing shelters, and using fire. These characteristics speak to their humanity, but only limitedly. Like other races, their humanity is still in question—lying somewhere between beast and civilized man.

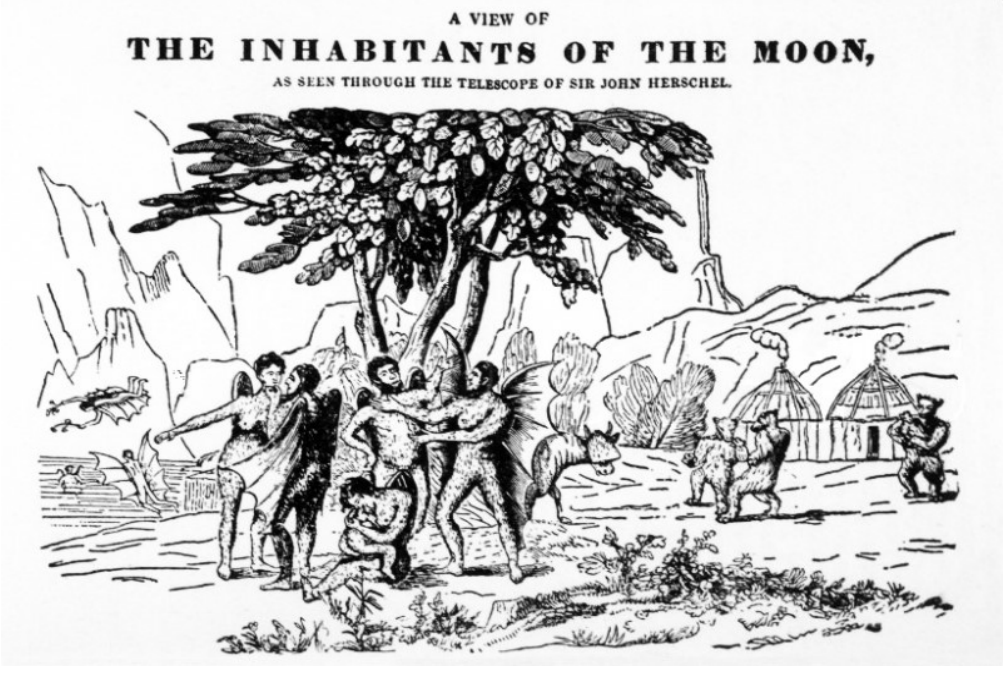

Figure 3

'Great Astronomical Discoveries' The New York Sun August 25th, 1835.

As Herschel continues to scan the moon, the nature of the landscape changes. He discovers more animal life but, as opposed to the animals associated with 'savage' peoples, the bison of the Great Planes and antelope of the Savanah, there is fauna more familiar to the West. The first is a horned quadruped with a 'body like a deer'. The second was 'so well known to us that we fairly laughed at the recognition of so familiar an acquaintance in so distant a land'. They discover sheep that 'would not have disgraced the farms of Leicestershire, or the shambles of the Leadenhall-market', for they could 'find no mark of distinction between these and those of out native land' (p. 31).

Immediately after this pedestrian discovery, Herschel discovers human beings confirming his theories—he 'was confident that if ever we found beings in human shape it would be at this longitude'. Obviously, the beaver-like humanoids with 'huts better than most savages' did not fully qualify. However, these new humanoid beings possess some characteristics that distinguish them from human beings. Particularly they possess wings with which they can fly and 'short and glossy copper-colored hair on their whole body'. This unique characteristic causes Herschel to identify them as 'vespertilio-homo, or bat-man' since they are 'similar in structure to a bat'. Here Locke hints at a polygenesis theory of race again. The semblance to bats is obviously unique from both the bever-raced savages and terrestrial humans, suggesting a different species of origin. Beyond these unhuman characteristics, these second humanoids have a hairless face, 'yellow flesh color', dark colored hair on the top of their head which is 'closely curled but apparently not woolly', and a 'thick beard upon the lower jaw'. This description causes the audience to dissociate them from stereotypes of black or Asiatic peoples. When 'engaged in conversation' their 'gesticulations, more particularly the varied action of their hands and heads, appear impassioned and emphatic'. But, this second race is 'not perhaps as high of order as the other which we discovered next month' (pp. 36-38).

This final Moonarian race in Locke's scheme is not described primarily in terms of physical appearance. They are only described as 'larger in stature, less dark in color, and in every respect an improved variety of the race'. Thus, we are asked to understand them in negative terms with the other races—marked by what they are not, namely dark or savage, rather than positive physical attributes. More thoroughly described is their artifice. We are presented with

'a magnificent work of art…a temple—a fane of devotion, or of science, which…is devotion of the loftiest order' displaying that their infrastructure is more significant for understanding them than their bodies. Strangely enough, perhaps a latent acknowledgement of white European commodity fetishism, the text specifically comments that Herschel and his fellow scientists 'had no opportunity of seeing them engaged in any industry or art' but instead finds them 'engaged in their rural banquets or in social conversation'.[1] Finally, despite being hierarchically structured, that is 'creatures of order and subordination', they existed 'without the least manifestation of fear' in a 'universal state of amity', implying that their society, perhaps itself steeped in the idolization of hard work and the free market, are fair and just as well as unequal—a liberal paradise (pp. 43-45).

Thus, Locke presents before Western audiences not only an image of itself in comparison to other races, but an image of what the West wants to believe about itself. It is racial whiteness viewed through a soft lens. At the height of colonialism, and therefore the height of colonial contradiction, The Moon Hoax takes stock images of the expansion in Africa as well as of the metropole and carries them into the hinterland via oxcart and projects them into space where, as we will see, they remain until recently in the 20th century. At this point, a renewed interest in contacting extraterrestrial life leads prominent scientists to, once again, categorize extraterrestrial life, in essence, finding the discarded and discredited colonial project of earlier astronomy cleansed from overt racism and seemingly ready for reapplication.

Bracewell, Tribal Structure, and Cyborgs

Above it is noted that during colonization, from the 17th to the 19th century, discussions of extraterrestrial life easily blurred with the racialization of non-Europeans. Thus, the intellectual exploration of space acted to latently justify colonial power through the co-racialization of extraterrestrial life. But how does the discussion of extraterrestrial life change in the twentieth century as colonialism recedes and racialized explanations based on physical differences become taboo in the social sciences and humanities? It lingers, if only in muted form.

One example of continued colonial discourse is Bracewell's (1974) The Galactic Club. This continued racialization is subtly seen in how artwork is used throughout the book. The text is filled with images drawn from the works of the Kenyan artist Jesse Allen. Highly impressionistic, brightly colored, with a flowing and sometimes tentacle-like quality, Allen's work attempts to reconstruct landscapes, often of his native Kenya, into what he describes as a 'secret place' that is 'beautiful, complete in everything, logical in its own logic, systematic in its own system, alive in its own life' (Jesse Allen Art, 2020). In Bracewell's text these highly stylized African landscapes are recast as images from another planet. The otherness ascribed to Africa serves to interpolate the audience into the otherness of space. It shows that colonial discourse latently thinks of Africa as another world already, as distinct from itself as a distant planet. Thus, the landscape stands proxy for the difference between life on other planets. The alterity of both being reinforced and heightened by each other.

This conflation at the surface of texts parallels the alterity found within. Bracewell offers some of the most stunningly different images of extraterrestrials in scientific literature, particularly seen in his attempt to answer the question that, if contact is made with extraterrestrial life 'how could we ever understand the mentality of such a creature?' (p. 85). The question of communicating with extraterrestrial life later becomes the guiding question for the field of astrolinguistics, which seeks to develop a lingua cosmica universal enough to allow for interstellar communication. Ironically, these universals are themselves replications of European culture (being constructed out of mathematics, musical notation, or high ordered logic) which unquestioningly is used to represent all of humanity and intelligent life throughout the universe (Oberhaus, 2019).

Bracewell's discussion does not lead one to interstellar communication, though, but explores the possibility that, resulting from extreme physical environments, differences between forms of life may be too great to overcome. He posits two extended examples, potential forms of intelligent life, to illustrate. The first is the possibility of intelligent colonies of scum. In an environment where planetary size causes the force of gravity to be particularly strong, evolution would favor organisms that remained closer to the ground. In such an environment Bracewell imagines that an algae-like species may gain intelligence. This scum would be composed of single cell plants forming on the surface of water and

'would not be an individual [...] but rather a *whole tribe* [added emphasis]!' 'Because of the modest abilities of unicellular organisms', within this intelligent assemblage, 'cooperation and specialization would be required on an intimate scale' (p. 87).

Why does Bracewell choose this intelligent scum, with its perfectly collectivistic social structure as an example of extreme otherness? This may partially be because of the Cold War. Something so opposite to individualistic capitalism would be something 'unhuman', something outside of the transhistorical narrative of competition and markets that liberal democracies tell themselves. But it is also possible that underlying this feeling of alterity are late 19th and early 20th century philosophies of indigenous peoples. There is a distinct similarity between the description of 'primitive' peoples by Durkheim (2001; 2014), Saint-Simone (1974), Comte, or Spencer (1961) and Bracewell's intelligent scum. They lack individuality, sociologically and even physically, from one another and can be indistinguishable. This is, after all, the image of Durkheim's mechanical solidarity, taking as its metaphor a worm, whose pieces are interchangeable and replaceable, which gives the 'society' a stable and eternal quality when compared to highly differentiated 'modern' societies. In forming the alterity of extraterrestrial life, Bracewell borrows on ideas already within the Western cultural mentality, mainly existing as forms of otherness invented by colonial discourse.

Bracewell's second extreme form of life is that of intelligent machines. Here alien life occupies a planet slipping into a 'steadily intensifying ice age which biological organisms did not expect to survive' and, therefore, they 'made the machines out of a desire to preserve their culture'. Such life would be 'intellectually indistinguishable from its creators', and would have been 'intrust[ed]' with 'a few fertilized eggs on ice...should conditions permit individuals be created in their original form' (pp. 88-89). Here Bracewell points to forms of difference beyond the colonial that are, nonetheless, terrestrial differences being projected into the heavens. These intelligent machines blur distinctions between man and machine, artifice and life, which are quintessential of Western humanism. Thus, Bracewell sets before his audience a being resembling the 'cyborg' of posthuman thought promoted by Haraway (1991), as an extreme form of difference with whom, for Bracewell,

communication would be impossible.

After this display of radical alterity, Bracewell shifts from outer space to differences in human culture. He notes that, resulting from the 'different lifestyles of human societies…difficulties can arise when one human group tries to communicate with another'. But, for Bracewell, these differences amount to nothing in comparison to communications with extraterrestrials because 'at least we are all human'. Thus, biological limitations place certain parameters on human life, parameters that are intersubjectively shared among human beings but may not be shared with other organisms. For example, 'different human societies share approximately the same life span'. For other life forms this may not be the case. They may possess 'a life span averaging 200 years'. As a result of this biological difference their:

> lifestyle would be radically altered. There would be a small portion of 1,000-year-olds, including a sprinkling of patriarchs playing dominate roles such as are not seen on earth. Under the conditions of zero population growth, child-bearing years would become a brief interlude, and if the intelligent creatures were descended from wild ancestors that bore litters rather than primarily single offspring, then the average family would never be called upon to have children at all. A human spokesman entering into discourse with a member of such a society could be excused for feeling like a provisional fish out of water. (pp. 88-89)

Here we see Bracewell borrowing a recognizable form of cultural difference, that of kinship, in a heightened manner. Anthropology, especially when it was little more than the Western science of the Other, specifically concentrated on kinship, so much so that Eriksen (2015) anecdotally remarked how 'towards the end of the 1940s kinship was so central …anthropologists, and not least students, spoke ironically of the subject as 'kinshipology'' (p. 117). Bracewell, likewise, posits a kinship system, seemingly modeled after an anthropological description of indigenous peoples. Most notably he displays an alternative form and familial authority of community elders and a form of descent (in this case the result of breeding in 'litters'), to differentiate extraterrestrials. By beginning with human cultural differences and sliding into the biological differences of extraterrestrials, we see again a fluidity between the biological and the cultural.

With all three forms of alterity, Bracewell's view on difference can be thought of as a scale ranging in measurement from biologically similar to the biologically different. While he admits this would be greater between different organisms than between human beings, by fluidly shifting from human cultural difference to differences in biological structure, he latently suggests that cultural and biological differences may be interchangeable or, at the very least, that delineating the cultural from the biological, in terms of the ability for human beings to communicate and live together, is somewhat irrelevant. In sum, Bracewell presents a conflation of terrestrial/extraterrestrial and cultural/biological and a continuation of a colonial mentality that, if discussed directly, would be increasingly taboo in the academic discourse of his time. By discussing extraterrestrial life, themes of biological determinism are allowed to persist as late as the 1970s. Bracewell can, therefore, discuss cultural differences in an almost Spenserian way, where cultural difference is determined primarily in the biology of its members.

Panspermia and the Fermi Paradox

The ramifications of the colonial roots of extraterrestrial alterity, as a form of mythical alterity, and its ability to reconstitute colonial discourse can also be seen in the Fermi Paradox. According to astrological lore, the paradox has its origins in the 1950s at the Los Alamos nuclear test site. After overhearing a conversation about extraterrestrial life, the Nobel laureate Enrico Fermi, long after the conversation had ended, randomly exclaimed, 'But where are they?' This simple statement spawned an entire genre of extraterrestrial research with the base assumption that, if there are technologically advanced civilizations in space, they would try to expand beyond their planet, contact alien life, or colonize space. Since contact with such life has not occurred, it is safe to assume that either they do not exist or there is some reason that life cannot expand into space. Born in the neon glow of imminent nuclear war, the Fermi Paradox offers a cynical interpretation of Western technological development. We have not met intelligent life from other planets because Western notions of civilization, specifically civilization through technological advancement, are antithetical to the continuation of life. If alien life pursued science and technology to the extent necessary to contact life, to the extent that Western nations have, they would

have destroyed their planet, disintegrating themselves in clouds of atomic energy, long before they could colonize space (Frank, 2018; Dick, 1996).

Much of the astrobiological community, unable to accept Fermi's interpretation of Western technocentrism, offered alternative solutions to the paradox, solutions which reconstitute Western scientific hegemony and the myth of civilization. One example of this is the resurgence of panspermia. Originating with Arrhenius' (1909) 1907 article 'Panspermy', which postulated that life on earth was propagated by spores from other planets that were carried in the pressure created by the light of other stars, panspermia promises to explain the origins of life on earth. Borrowing on the work of Kelvin (1871), Arrhenius maintained the 'impossibility of converting lifeless into living matter without the aid of already living organisms', suggesting instead that life 'infected' the earth from other planets (p. 196). Arrhenius' spore hypothesis is later rejected by most astrobiologists, most notably Sagan (1973), who illustrates that spores would receive such a large dose of solar radiation to travel in this manner that they would become infertile. Nonetheless, within the context of the Fermi paradox, panspermia finds new relevance by indicating that intelligent life from other planets may have already visited the earth, possibly in a primordial past beyond the recollection of history, and have simply not returned to earth. Several variations of this theory exist. Gold (1960) adapts Arrhenius' spore hypothesis to hypothesize that life may have originated with microorganisms in the disposed waste of cosmic visitors. Crick and Orgel (1973) suggest that, rather than an accidental byproduct of space travel, life on earth may have been a purposeful, or directed, panspermia. That:

> The hypothetical senders on another planet may have been able to prove that they were likely to be alone and to remain so. Or, they may have reached this conclusion mistakenly. In either case, if they resembled us psychologically, their motivation for polluting the galaxy would be strong, if they believed that all or even the great majority of inhabitable planets could be given life by directed panspermia. (pp. 342-343)

This is an ironic statement. Projecting ourselves into space, if only psychologically, suggests that life on another planet would be motivated to replicate their DNA elsewhere in the universe. It is also a statement which latently justifies the expansionist rhetoric of European colonialism. Whether in

the Mise ent Valure, manifest destiny, or the push to 'make the world England', colonial desire for self-replication across the globe is infamous. But here we see, in the postcolonial era, its naturalization continuing. Just as Darwin (1889) naturalized colonial conflict by suggesting that it represented the natural evolutionary process of more evolved races to expand and destroy less evolved races, many forms of panspermia continue to justify the desire for territorial expansion of Western culture, embedded in the same bodily reproduction of the organism described by Darwin and assumed as relevant to all intelligent living beings throughout the universe. The 'in either case, if they resembled us psychologically', displays that, without contrary information, without any contact with real extraterrestrial life, it is fair to assume they resemble an unspecified 'us'—an us which seeks constant growth through territorial expansion, which is the colonizer.

A similar assumption is present in Hoyle and Wickramasinghe's (1978) discussion of a potential alien invasion. Their theory of the lifecloud marks one notable exception to astrobiology's migration away from Arrhenius' sporal theory of panspermia. They suggest that 'life arrived eventually on Earth by being showered already by living cells from comet-type bodies'. Such comets picked up these living cells from a 'lifecloud', an 'interstellar cloud of gas and dust', which gained the living cells in cosmic explosions' (pp.13-14). Because this is a 'picture…of vast quantity of the right kind of molecules simply looking for a suitable home', it is a perspective where 'the prospect for the emergence of life on a galactic scale appears very favorable'. This places Hoyle and Wickramasinghe in the position of having to answer the Fermi Paradox, or as they put it, the abundance of life would suggest a 'predator-prey relationship' in which 'the first animal to emerge anywhere in the galaxy with an adequate technology would extend its search for prey outwards from its own stellar systems where colonization is possible' and that 'the earth must reasonably be suitable for colonization' yet 'colonization has not occurred'. To escape the paradox, they suggest that 'the predator-prey relationship…is not something static'. At this point they turn from the extraterrestrial to the terrestrial by utilizing British settler colonialism as an analogy. There has been a 'vast change' in the predator-prey relationship between technologically advanced settlers and indigenous peoples 'over the past 100 years'. In Australia 'abos

were shot for fun' and in the US 'the only good Indian was a dead Indian' but today 'Australia seeks to prevent the slightest interference' and 'Indians may well succeed in reclaiming much of tribal land'. But 'both can be explained by the age-old aspect of the attitude of predators to their prey' that 'predators always abandon old prey if a new and better form of prey happens to turn up'. Thus, the supposed reformed attitude of Australia and the US reflect that 'there is much less advantage to exploiting'. They go on to contrast this with South Africa where 'white Africans tend to exploit blacks because there is still a good deal of advantage to do so'. This analogy, which obviously naturalizes and biologizes historical and, at that time, continued colonial atrocities, is then reapplied to the extraterrestrial. Their solution to the paradox of interstellar colonization is that 'the predator-prey advantage…would be nil' because 'any prey…does not reach the predator within the predator's own lifetime' and to do so they would have to have 'lifetimes appreciably longer than a thousand years' (pp. 157-160). In essence, extraterrestrial life is not present in our solar system, because the biological imperative which simultaneously caused colonialism and decolonization, a path which would have been followed by any technologically superior race if conditions are correct, would not be fulfilled by the colonization of outer space.

An alternative explanation for the non-presence of extraterrestrial life, which is sometimes intertwined with directed panspermia, is the zoo hypothesis. According to the zoo hypothesis, regardless of whether life on earth originated from extraterrestrial intervention or organically, it is probable that superior life forms have purposefully avoided contact with Earth. The term originated with Ball (1973) who explained through an analogy that, while 'civilizations on earth indicate that most of those civilizations that are behind in technological development would eventually be engulfed and destroyed, tamed, or perhaps assimilated', 'we' nonetheless 'do not always exert the power we possess' and instead 'set aside wilderness areas, wildlife sanctuaries, or zoos in which other species (or other civilizations) are allowed to develop naturally'. Furthermore, 'the perfect zoo…would be one in which the fauna inside do not interact with and are unaware of their zookeepers' (pp. 348-349). According to O'Neill (1989):

> On our planet we have seen, again and again, the effect of the contact between a primitive culture and a more advanced one. Almost invariably the more primitive is shattered. The destruction may not be intentional…yet it occurs because the values and the knowledge gained over the centuries by the primitive culture become, overnight, of little value by comparison. (p. 191)

If extraterrestrial life were to make contact, the result would be the same. After 'the excitement and the novelty have worn off' it would 'kill our arts and sciences'. Thus, O'Neill concludes that, 'they may be out there but they're kind enough to keep quite' (p. 191). Similarly, the interdict hypothesis put forward by Forgan and Magalhães (2001; 2016; 2017) suggests that the various extraterrestrial civilizations may have agreed to allow planets to develop to certain technological points before contacting them and are likely, even observing us from nearby locations yet undetectable to us. Although ethically and politically different from the other forms of panspermian justification of genocidal acts through biological determinism, the zoo hypothesis rest on equally dangerous assumptions. Most notably, the inherent inferiority of anything outside of Western technocracy leads to an automatic outcome of cultural destruction. Just as with Hoyle and Wickramasinghe's predator-prey distinction, the West is not culpable for its historical and current resource extraction regimes nor its lingering racial philosophies and policies. Instead, it was the necessary outcome of any interaction between superior and inferior cultures. Furthermore, the logic of the zoo hypothesis is similar to early justifications for the now infamous volkseie of the apartheid in South Africa, which often stated concern for the preservation of Bantu language and culture—that both indigenous Africans and colonists, particularly poor whites, suffered because of their interaction. Instead, the various ethnic groups in South Africa would develop best if left untouched by Western intervention (Gordon, 1988). The long and violent history of this system is beyond the scope of this article, but it is interesting to acknowledge the role of paternalistic isolation in its formation—a logic which also pervades the zoo hypothesis. With its clearly hierarchical division of planets on the basis of 'technological advancement', a term which obfuscates an allegiance with 19th century discussions of civilization, mixed with a fear of indigenous cultural extinction, in the Zoo Hypothesis we see paternalism as an enemy of cultural hybridity and any desire to allow indigenous peoples, be they indigenous to 'the earth' or a specific

region of it, to utilize the massive artifice of discourse or its massive material production of a 'technologically advanced' race for their own active and agented forms of self and societal reinterpretation from the lens of human or non-Western peoples. The technologically advanced extraterrestrial/colonial regimes not only avoid the destruction of earths/indigenous cultures but remain removed from the gaze of the other, and thus beyond any critique this may provide of technological and hierarchical schemas. In doing so the zoo hypothesis justifies the removal of the material benefits of an 'advanced' culture —material benefits, which unlike real colonialism, have not been extracted from the population which it seeks to 'protect' from its influence.

Thus, the extraterrestrials of panspermianism and the zoo hypothesis serve as a proxy for Western imperialists, often in the name of defending Western technocentrism against the threat of the Fermi Paradox. They not only allow for the continuation of colonial discourse, which has largely been the site of intellectual criticism in the social sciences and humanities, and largely persisting because of the lack of real connection with extraterrestrial subjects; as a result, they continue to justify forms of alterity used against postcolonial subjects who are their own contemporaries. Taken together, we see throughout the modern history of extraterrestrial science an impulse to preserve existing forms of difference or resurrect forms of alterity already fading away.

Conclusion

From the authoritarian response to Syrian and Guatemalan refugees, to the continuation of ghettoization of African Americans through the carceral system, the racialized logics formed in colonial discourse have displayed remarkable resilience. Although on the surface it may seem unimportant or even a distraction to pause and consider the alterity of extraterrestrial life in scientific literature, such an analysis strikes to the core of this resilience. Even beyond the inertia of power and wealth, the structure of racism's rhetoric of otherness lends this mentalité an aura of plausibility. Despite decades of denial concerning the significance of racial biological difference from the scientific community, racism appears on the rise in Europe and North America. Mythical alterity is a malleability in discourse which contributes to this continuation. Even when

colonial alterity can be denied for real human subjects this does not mean that alterity disappears. It is instead stored in others whose plausible existence can be assumed but not confirmed. These mythical others serve as a battery storing the racializing energies. These energies permeate popular media and everyday apprehensions until, later, when the winds of politics change, they are once again unleashed upon postcolonial subjects. Extraterrestrials are not alone in possessing mythical alterity. Western thought is pervaded by worlds beyond our observation that are, nonetheless, supposedly real. From the bottoms of oceans, alternate dimensions, spirit worlds, and the last recesses of unexplored wilderness, epistemological spaces exist for a free play of alterity unchecked by the voices of those unto whom it is projected. They are the contemporary legend of Western hegemony which it whispers into its own ear. Le Goff (1980) once characterized the mythical Orionic horizon, the location in the East beyond the knowledge of the West, as a 'repository of dreams, myths, and legends' where 'raptures and nightmares were mixed' (p. 190). Outer space is used as such a receptacle. But such horizons are not an event horizon—the location in collapsed stars from which nothing escapes. What we project into space inevitably returns.

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List of figures

Figure 1: *Aldrin Poses for Portrait*, Apollo 11 Image Gallery (AS11-40-5903).

Figure 2: Galileo's (1610) Sidereus Nuncius. Sourced from Wikimedia Commons.

Figure 3: 'Great Astronomical Discoveries' The New York Sun August 25th 1835. Sourced from Wikimedia Commons.

Notes

[1] This is not to suggest that Locke is acknowledging Marx's concept of commodity fetishism but that the text itself presents the superior beings of the moon as existing in a state of fetishism, possessing a material culture without laboring to produce it or acknowledging the real labor behind it.

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