Viewing the Future of Space Property Through the Lens of Colonialism

INTRODUCTION

In this note, I will first introduce the Space Race, its lasting impact, and the implications it places on our understanding of property law. I will then discuss common law colonial legal doctrines and their potential impact on space property law. I will also analyze the development of international treaties and agreements in the field of space law and evaluate the effectiveness of treaties compared to common law colonial doctrines. From there, I will discuss how current and future changes in technology and space exploration, including the role of private individuals and companies, will impact the current space law framework and discuss which aspects of international law and colonial law are suited or unsuited to meeting those challenges. Finally, I will gauge the important factors in developing a space property framework and introduce an alternative form of property governance that shares the values of past international agreements while simultaneously safeguarding the common interest in space in the future.

I. THE SPACE RACE: PAST, PRESENT, AND FUTURE

a. The Past

On May 25th, 1961, President John F. Kennedy addressed a joint session of Congress and stated boldly, "I believe that this Nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth."[1] President Kennedy's proclamation could have been simply a dramatic political move,[2] but in 1961, this move was singularly ambitious.[3] Only twenty days earlier, Alan Shepard became the first American in space.[4] Shepard's flight lacked much of what we envision when we think of spaceflight. His capsule did not even have a window and the flight lasted only fifteen minutes and twenty-two seconds.[5] At the time, Kennedy's goal for the country was truly an American dream, only captured by imagination rather than reality. Although Kennedy understood there would be a cost to the dream,[6] he could not know at the time what or who would be

1 President John F. Kennedy, *Address to Joint Session of Congress May 25, 1961*, JOHN F. KENNEDY PRESIDENTIAL LIBR. & MUSEUM, https://www.jfklibrary.org/learn/about-jfk/historic-speeches/address-to-joint-session-of-congress-may-25-1961 (last visited Mar. 26, 2024).

2 Roger Launius, NASA's former chief historian, said that the lunar program was "an attempt to change the subject." Samantha Bresnahan, *Sixty Years Ago, This JFK Speech Launched America's Race to the Moon*, CNN (May 25, 2021, 3:31 AM), https://www.cnn.com/2021/05/25/world/jfk-may-1961-moon-speech-spc-scn-intl/index.html.

3 Fredrik Logevall, professor of history at Harvard University, said Kennedy made "a weighty proposition" because he "needed to do something dramatic." *Id.* Kennedy himself acknowledged the significance of the undertaking he was demanding in his speech. "No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish." Kennedy, *supra* note 1.

4 "Mercury Redstone 3 (MR-3, also designated Freedom 7) was the first flight of an American rocket with a human on board (Alan B. Shepard, Jr.), occurring twenty-three days after Yuri Gagarin's orbital flight of Vostok 1." *Mercury Redstone 3*, NASA SPACE SCI. DATA COORDINATE ARCHIVE, https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=MERCR3 (last visited Mar. 26, 2024).

5 *Id.* ("The Mercury capsule lacked a window through which Shepard could view his surroundings, but a periscope allowed him views of the outside during the pre-launch and weightless phases of the mission. . . . The duration of flight was 15 minutes and 22 s, with weightlessness lasting for about 5 minutes.").

6 In his May 25, 1961, speech, Kennedy recognized the burden the space program would place on the United States. He stated,

> I believe we should go to the moon. But I think every citizen of this country as well as the Members of the Congress should consider the matter carefully in making their judgment, to which we have given attention over many weeks and months, because it is a heavy burden, and there is no sense in agreeing or desiring that the United States take an affirmative position in outer space, unless we are prepared to do the work and bear the burdens to make it successful.

Kennedy, *supra* note 1.

He concluded his speech by saying,

> I have not asked for a single program which did not cause one or all Americans some inconvenience, or some hardship, or some sacrifice. But they have responded and you in the Congress have responded to your duty—and I feel confident in asking today for a similar response to these new and larger demands.

Id.

sacrificed to make the dream come true.[7] He would never know, as he was assassinated in Dallas on November 22, 1963.[8] However, Kennedy's dream did not die with him; on July 20, 1969, before the decade was out, the United States landed a man on the Moon.[9]

b. The Present

Although the last manned mission to the Moon took place in 1972,[10] the space race has recently awoken from its hibernation. The National Aeronautics and Space Administration ("NASA"), once again, plans to return to the Moon during its Artemis missions, this time hoping to establish a base camp on the lunar surface.[11] However, spaceflight is no longer the sole province of nations. SpaceX, a private company that began manned spaceflight in 2020,[12] has long sought to achieve space colonization.[13] Blue Origin, a competing private company owned by Jeffrey Bezos,[14] completed its first manned spaceflight in 2021.[15] Countries such

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7 Before an Apollo mission ever flew, three astronauts, Gus Grissom, Ed White, and Roger Chaffee, died in a fire during training for the first crewed Apollo flight. David R. Willliams, *The Apollo 1 Tragedy*, NASA SPACE SCI. DATA COORDINATE ARCHIVE (Jan. 16, 2018), https://nssdc.gsfc.nasa.gov/planetary/lunar/apollo1info.html.

8 *November 22, 1963: Death of the President*, JOHN F. KENNEDY PRESIDENTIAL LIBR. & MUSEUM, https://www.jfklibrary.org/learn/about-jfk/jfk-in-history/november-22-1963-death-of-the-president (last visited Mar. 26, 2024).

9 Sarah A. Loff, *Apollo 11 Mission Overview*, NAT'L. AERONAUTICS & SPACE ADMIN. ("NASA") (Apr. 17, 2015), https://www.nasa.gov/history/apollo-11-mission-overview/ ("Apollo 11 launched from Cape Kennedy on July 16, 1969 carrying Commander Neil Armstrong, Command Module Pilot Michael Collins and Lunar Module Pilot Edwin "Buzz" Aldrin. . . . On July 20, Armstrong and Aldrin entered the LM. . . . Partially piloted manually by Armstrong, the Eagle landed in the Sea of Tranquility . . . .").

10 Apollo 17 was the last human expedition to the Moon. *Apollo 17: Mission Details*, NASA (Apr. 7, 2011), https://www.nasa.gov/missions/apollo/apollo-17-mission-details/.

11 "We will collaborate with commercial and international partners and establish the first long-term presence on the Moon. . . . We will build an Artemis Base Camp on the surface and the Gateway in lunar orbit." *Artemis*, NASA, https://www.nasa.gov/specials/artemis/index.html last visited May 8, 2024).

12 In November 2020, a four-person crew launched from Kennedy Space Center toward the International Space Station aboard SpaceX's Crew Dragon capsule and Falcon 9 rocket in "SpaceX's first operational crew rotation flight to the orbiting outpost." Stephen Clark, *Astronauts Fly with SpaceX in Landmark Launch for Commercial Spaceflight*, SPACEFLIGHT NOW (Nov. 16, 2020), https://spaceflightnow.com/2020/11/16/astronauts-ride-spacex-crew-capsule-in-landmark-launch-for-commercial-spaceflight/.

13 "Mars has long been the goal of [Elon] Musk and SpaceX." Kenneth Chang, *Elon Musk's Plan: Get Humans to Mars, and Beyond*, N.Y. TIMES (Sept. 27, 2016), https://www.nytimes.com/2016/09/28/science/elon-musk-spacex-mars-exploration.html. "To establish a self-sustaining Mars civilization of a million people would take 10,000 flights. . . . 'We're going to need something quite large to do that,' Mr. Musk said. It would take 40 years to a century before the city on Mars became self-sufficient, he said." *Id.*

14 "Blue Origin was like Willy Wonka's chocolate factory in the children's book by Roald Dahl. It was a rocket company founded by Jeffrey P. Bezos, the billionaire who had created Amazon." Kenneth Chang, *Jeff Bezos Renews Focus on Blue Origin, Which Has Been Slower to Launch*, N.Y. TIMES (Oct. 13, 2021), https://www.nytimes.com/2021/02/03/science/blue-origin-jeff-bezos.html.

15 "Blue Origin successfully completed New Shepard's first human flight today with four private citizens onboard. The crew included Jeff Bezos, Mark Bezos, Wally Funk and Oliver

as Russia[16] and China[17] have also begun work on ambitious lunar missions of their own. Although NASA is hiring and collaborating with companies like SpaceX for their rockets[18] and Axiom Space for their space suits,[19] the competition among various countries and companies to grab a foothold in space is very much alive.

But why does space have such a gravitational pull? Why was the Moon landing not enough to satiate humanity's collective desire to venture into the cosmos? In 1962, President Kennedy gave a speech at Rice University in Houston: the heart of NASA.[20] He ended it by recalling climber George Mallory's famous words when asked why he wanted to

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Daemen, who all officially became astronauts when they passed the Kármán Line, the internationally recognized boundary of space." *Blue Origin Safely Launches Four Commercial Astronauts to Space and Back*, BLUE ORIGIN (July 20, 2021), https://www.blueorigin.com/news/first-human-flight-updates/.

16 Russia has begun its first Moon mission in the modern era with Luna-25 planned to launch in July of 2023, and 3 more Russian lunar missions are planned to launch before 2030. *First Moon Mission in Russia's Modern History Set for July 13*, TASS (Feb. 23, 2023), https://tass.com/science/1580885.

17 China is working on building a "roughly 90-meter-tall rocket resembling a Long March version of SpaceX's Falcon Heavy, capable of sending 27 tonnes of payload into translunar injection." Andrew Jones, *China's Moon Missions Shadow NASA Artemis's Pace*, IEEE SPECTRUM (Sept. 7, 2022), https://spectrum.ieee.org/china-moon-mission-artemis. These rockets will "by 2030, according to leading Chinese space officials, be able to put a pair of astronauts on the moon for a 6-hour stay." *Id.* China has made some significant accomplishments in its lunar program already, such as becoming the "first country to safely land a spacecraft on the far side of the moon" and performing the "first sampling of lunar material in over four decades." *Id.* According to journalist Andrew Jones, "NASA is leading humanity's journey to the moon, but China's steady accumulation of capabilities and long-term ambitions means it will likely not be far behind." *Id.*

18 "In April 2021, NASA selected SpaceX to develop a human landing system variant of its Starship vehicle to take astronauts to the lunar surface during NASA's Artemis-III mission. As part of that contract, SpaceX will conduct an uncrewed demonstration mission to the Moon prior to Artemis III." Jamie Carter, *NASA and SpaceX's Jaw-Dropping Plan to Land Two People on the Moon Are now 'Go'*, FORBES (Nov. 16, 2022, 8:00 PM), https://www.forbes.com/sites/jamiecartereurope/2022/11/16/nasa-and-spacexs-jaw-dropping-plan-to-land-two-people-on-the-moon-are-now-go/?sh=17f21f20476d.

19 "NASA has selected Axiom Space to deliver a moonwalking system for the Artemis III mission which will land Americans on the surface of the Moon for the first time in over 50 years." Roxana Bardan, *NASA Taps Axiom Space for First Artemis Moonwalking Spacesuits*, NASA (Sept. 7, 2022), https://www.nasa.gov/press-release/nasa-taps-axiom-space-for-first-artemis-moonwalking-spacesuits. The value of this contract is $228.5 million dollars. *Id.* "[The Axiom Space] award – the first one under a competitive spacesuits contract – is for a task order to develop a next generation Artemis spacesuit and supporting systems, and to demonstrate their use on the lunar surface during Artemis III." *Id.*

20 President Kennedy noted the importance of Houston, the location of Rice University and NASA, to the space race, saying,

> Houston, your City of Houston, with its Manned Spacecraft Center, will become the heart of a large scientific and engineering community. During the next 5 years the National Aeronautics and Space Administration expects to double the number of scientists and engineers in this area, to increase its outlays for salaries and expenses to $60 million a year; to invest some $200 million in plant and laboratory facilities; and to direct or contract for new space efforts over $1 billion from this Center in this City.

Address at Rice University on the Nation's Space Effort, JOHN F. KENNEDY PRESIDENTIAL LIBR. & MUSEUM, https://www.jfklibrary.org/learn/about-jfk/historic-speeches/address-at-rice-university-on-the-nations-space-effort (last visited Mar. 26, 2024).

climb Mount Everest.[21] Kennedy said that, like Mount Everest, space too would be climbed.[22] Perhaps when we gaze into the stars every night, our imagination is captured like nothing of this earth can do. Perhaps we are compelled again and again to return to space and go farther than the last time for the same reason George Mallory attempted to summit Mount Everest until the mountain claimed his life: "Because it is there."[23]

c. The Future: Implications of Space Colonization on Property Law

The Moon had been summitted in 1969, but like the climbers in the Himalayas, the Apollo astronauts came back to Earth once their trek was complete. This current generation of space travel is not like summiting Everest. Instead, it is first the step into a far greater and more arduous prospect: humanity's residence among the stars. Although it is arguable that space colonization in the immediate term is not a solution for human survival,[24] permanent human establishments in space seem inevitable.[25]

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21 "Many years ago the great British explorer George Mallory, who was to die on Mount Everest, was asked why did he want to climb it. He said, 'Because it is there.'" *Id.*

22 *Id.* ("Well, space is there, and we're going to climb it, and the moon and the planets are there, and new hopes for knowledge and peace are there. And, therefore, as we set sail we ask God's blessing on the most hazardous and dangerous and greatest adventure on which man has ever embarked.").

23 "Most people think the famous climbing phrase 'because it is there' was first uttered by Edmund Hillary when he and Tenzing Norgay conquered Mount Everest in 1953. Not so. Actually George Leigh Mallory, three decades earlier, said it as he prepared to scale the world's highest peak." *"Because It's There"*, FORBES (Oct. 29, 2001, 12:00 AM), https://www.forbes.com/global/2001/1029/060.html?sh=5c594fd92080. "[Mallory] and his partner, Andrew Irvine, were last seen alive less than 300 meters from the summit—still pushing upward." *Id.* Mallory's remains were found on Everest on May 1, 1999. *Id.*

24 Science writer Shannon Stirone ridicules Elon Musk's notion that Mars colonization is a desirable goal rather than improving life on Earth. When Musk states that Mars is a viable option for human migration, Stirone says,

> [Musk] couldn't be more wrong. Mars? Mars is a hellhole. The central thing about Mars is that it is not Earth, not even close. . . . [T]he only things our planet and Mars really have in common is that both are rocky planets with some water ice and both have robots . . . .

Shannon Stirone, *Mars is a Hellhole*, ATLANTIC (Feb. 26, 2021), https://www.theatlantic.com/ideas/archive/2021/02/mars-is-no-earth/618133/. She argues that Mars will present considerable challenges to human health and well-being. "For humans to live there in any capacity they would need to build tunnels and live underground, and what is not enticing about living in a tunnel lined with SAD lamps and trying to grow lettuce with UV lights?" *Id.* Because of these challenges, she points out that those like Musk could do much more to improve life for humans on Earth rather than sell Mars as humanity's hope for survival. "I question anyone among the richest people in the world who sells a story of caring so much for human survival that he must send rockets into space. Someone in his position could do so many things on our little blue dot itself to help those in need." *Id.*

25 NASA plans to build an Artemis Base Camp that will allow astronauts to live on the Moon for up to two months. Cmwarner, *Lunar Living: NASA's Artemis Base Camp Concept*, NASA (Oct. 28, 2020, 5:26 PM), https://blogs.nasa.gov/artemis/2020/10/28/lunar-living-nasas-artemis-base-camp-concept/. The Artemis program is intended to "lay the foundation for a sustained long-term presence on the lunar surface," which, according to Kathy Lueders, associate administrator for human spaceflight at NASA, will prepare them for an "'even greater adventure in the universe – human exploration of Mars.'" *Id.* This sort of long-term presence on either the Moon or Mars would require a form of continuously habitable settlement for astronauts to live.

Even if a majority of humans remain on Earth, commercial activity and industry could move to other planets.[26] Even the first steps toward permanent settlement or commercial exploitation in space will raise novel questions that challenge what we know about property rights in space.

The various international agreements and treaties on space will be tested to their limits by nations and companies who could challenge their enforceability. Companies might argue they have property rights in space that countries bound by treaty or agreement would not. National and private interests in space have already collided on Earth,[27] and once they collide in space, it will be even harder to distinguish what rights each party has and if they are at all enforceable. It is crucial to create certainty at the outset, and more so to create a functional system that furthers the current understanding of rights in space and guards against conflicts that will likely arise. A clear and consistent mode of how governments, companies, and individuals can and cannot create property rights in space will avoid needless conflict, costs, and litigation.

II. COLONIAL LEGAL THEORIES

a. Relevancy in the Modern Era

The notion of private property itself is a clash between public and private interests. A core component of private property rights is the right to exclude all others.[28] In space, the public and private interests are compounded by the fact that the "public" and "private" interests of one country may be very different than those of another. This push and pull of these varied interests is relatively unique when it comes to space. Therefore, scrutinizing large, historical migrations and legal claims over

26 Jeffrey Bezos is the founder of Blue Origin. Chang, *supra* note 14. He believes that polluting industries could be moved to space, hypothesizing that "[e]ventually it will be much cheaper and simpler to make really complicated things like microprocessors . . . in space and then send those highly complex manufactured objects back down to Earth so that we don't have the big factories and pollution-generating industries that make those things now." Isobel Asher Hamilton, *Jeff Bezos Says Space Travel is Essential Because We Are 'in the Process of Destroying This Planet'*, BUS. INSIDER (July 18, 2019, 7:59 AM), https://markets.businessinsider.com/news/stocks/jeff-bezos-space-travel-essential-because-destroying-planet-2019-7-1028364726. Despite saying that, as a result of space industrialization, "'Earth can be zoned residential,'" Bezos still opens the door for space colonization, saying, "'People are going to want to live on Earth and they're going to want to live off Earth — there are going to be very nice places to live off Earth as well.'" *Id.* This is a marked departure from Bezos' fellow private space venturer, Elon Musk, who is prioritizing colonization. Chang, *supra* note 13.

27 Blue Origin has sued NASA in federal court over not being awarded a lunar lander contract. Grace Kay, *Jeff Bezos' Blue Origin is Bidding on NASA's Lucrative Moon Contract Again After It Lost to SpaceX Last Year*, BUS. INSIDER (Mar. 24, 2022, 10:59 AM), https://www.businessinsider.com/jeff-bezos-blue-origin-to-bed-nasa-lunar-lander-spacex-2022-3.

28 The United States Supreme Court has previously stated that the right to exclude is one "so universally held to be a fundamental element of the property right." Kaiser Aetna v. United States, 444 U.S. 164, 180 (1979).

massive regions could inform how countries and companies would attempt to assert property rights in the vast expanse of space.

In terms of scale and impact, space colonization is arguably most analogous to the migration of humans out of Africa and the eventual settling in the far reaches of the Earth.[29] Although this massive emigration spanned tens of thousands of years, it was well before the creation of our complex weave of current legal rights.[30] Therefore, it is prescient to look toward perhaps the second most impactful form of human colonization: modern colonialism.[31] Here, the intertwining threads of interests and rights, considerations and justifications, have created frameworks that courts around the world struggle with to this day.[32]

The reality of colonialism is one of cost and oppression.[33] The cases that will be discussed reflect the racist and supremacist notions that are deeply intertwined with colonial legal theories. The cases will also show how property and land were once perceived by colonial countries. The cases reflect the themes of expansion and exploitation as well as the past and present concepts of empire.

The themes and rationalizations from colonial legal cases can not only inform of their past consequences but also provide a context to look at new realities. Although some colonial laws have been rejected in their countries,[34] and the laws of specific countries may not be directly applicable in outer space, legal analysis of colonial cases and treaties can demonstrate how individuals and nations pursue the creation of

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29 "Modern humans evolved in Africa roughly 200,000 years ago," and went on "to populate the rest of the globe." Carl Zimmer, *A Single Migration from Africa Populated the World, Studies Find*, N.Y. TIMES (Sept. 21, 2016), https://www.nytimes.com/2016/09/22/science/ancient-dna-human-history.html.

30 Three research groups came to the same conclusion: All non-Africans descend from a single migration of early humans from Africa. "The estimates from the studies point to an exodus somewhere between 80,000 and 50,000 years." *Id.*

31 "Colonization, more specifically European colonization, has had and still has a great deal of impact on nations, more specifically those of the global south, even though quite a bit of time has passed since Columbus set sails." Megan Caldwell, *The Effects of Colonization: How it Happened and how it Still Continues*, MEDIUM, (Feb. 19, 2017), https://medium.com/@megancaldwell62/the-effects-of-colonization-how-it-happened-and-how-it-still-continues-b463350d1ac5. Megan Caldwell looks at different examples of colonization's long-lasting political and economic impact. In one example, Caldwell says that the Belgian oppression of Congo and haphazard independence created "chaos and disruption that . . . led to civil wars and political corruption," which effected Congo long after Belgian colonization ostensibly ended. *Id.*

32 *See* McGirt v. Okla., 140 S. Ct. 2452 (2020) (holding that the State of Oklahoma did not have criminal jurisdiction over native defendants on reservation land); *Mabo v. Queensland [No. 2]* (1992) 175 CLR 1, 5 (Austl.). (holding that Murray Islanders hold native title over the land according to Australian law in opposition to the doctrine of *terra nullius*); Geurin v. The Queen, [1984] 2 S.C.R. 335, 336 (Can.) (holding that the Crown had an enforceable fiduciary duty to Canadian Aboriginal land).

33 Caldwell, *supra* note 31.

34 A 1992 High Court of Australia case rejected the colonial legal doctrine of "*terra nullius*." *See Mabo v. Queensland [No. 2]* (1992) 175 CLR 1 (Austl.). This case and "*terra nullius*" will be discussed further in this note.

property, sovereignty, and exclusion. An understanding of colonial legal theory can also help to discern how humanity should act after the lessons of colonialism in their future ventures into the universe. This note will address the legal theories under which companies and governments could create property rights in space and—after balancing public and private interests—argue how these theories should do so.

b. Discovery and Conquest

The legal foundation of colonies can, in many cases, be traced back to charters given by royals authorizing individuals, such as Christopher Columbus, to conquer in their name[35] or establishing claims to colonized land, like the Charter of New England.[36] Although language in these charters could be very broad,[37] once courts like the United States Supreme Court had to reckon with colonial claims to land, they supplemented these charters with two other methods of creating property: Discovery and Conquest.[38]

In the United States Supreme Court case *Johnson v. M'Intosh*,[39] the Court had to examine whether Piankeshaw Indians could grant title to

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35 In 1492, King Ferdinand and Queen Isabell of Spain charged Christopher Columbus "to discover and subdue some Islands and Continent in the ocean" and told Columbus that they "hoped that . . . [the Islands and Continent] will be discovered and conquered by your means and conduct." *Privileges and Prerogatives Granted by Their Catholic Majesties to Christopher Columbus: 1492*, AVALON PROJECT [hereinafter *Privileges and Prerogatives*], https://avalon.law.yale.edu/15th_century/colum.asp (last visited Mar. 26, 2024).

36 *The Charter of New England: 1620*, AVALON PROJECT, https://avalon.law.yale.edu/17th_century/mass01.asp (last visited Mar. 26, 2024).

> Whereas, upon the humble Petition of divers of our well disposed Subjects, that intended to make several Plantations in the Parts of America, between the Degrees of thirty-ffoure and ffourty-five; We according to our princely Inclination, favouring much their worthy Disposition, in Hope thereby to advance the in Largement of Christian Religion, to the Glory of God Almighty, as also by that Meanes to streatch out the Bounds of our Dominions, and to replenish those Deserts with People governed by Lawes and Magistrates, for the peaceable Commerce of all, that in time to come shall have occasion to traffique into those Territoryes, granted unto Sir Thomas Gates, Sir George Somers, Knights, Thomas Hanson, and Raleigh Gilbert, Esquires, and of their Associates, for the more speedy Accomplishment thereof, by our Letters-Pattent, bearing Date the Tenth Day of Aprill, in the Fourth Year of our Reign of England, France and Ireland, and of Scotland the ffourtieth, free Liberty to divide themselves into two several Collonyes.

Id.

37 The Charter of New England granted land very broadly between "the Degrees of thirty-ffoure and ffourty-five." *The Charter of New England: 1620*, *supra* note 36.

38 Johnson v. M'Intosh, 21 U.S. 543, 587 (1823).

> [The United States] maintain, as all others have maintained, that discovery gave an exclusive right to extinguish the Indian title of occupancy, either by purchase or by conquest; and gave also a right to such a degree of sovereignty, as the circumstances of the people would allow them to exercise.

Id.

39 21 U.S. at 543.

land that had also been granted by the United States government.[40] Chief Justice Marshall began the opinion by recounting the historical foundation of the European powers who colonized the Americas and describing the various wars, charters, and treaties that resulted in boundaries of the United States at the time.[41] Marshall tied the United States' sovereignty to the colonial powers vested by monarchs and their instruments.[42] He stated that (European) discovery of land "gave an exclusive right to extinguish the Indian title of occupancy, either by purchase or by conquest."[43] Marshall did not end his justifications there: perhaps to bolster the United States' claims or to denigrate the claims of native people, Marshall added that Europeans made superior use of the colonial land compared to natives.[44] Throughout the opinion, the theme of European superiority over native people is evident.[45]

The features of overt racism and colonization of native people, not just over land, in *Johnson* will hopefully not survive to claims of

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40 *Id.* at 571 ("The plaintiffs in this cause claim the land . . . under two grants, purporting to be made . . . by the chiefs of certain Indian tribes, constituting the Illinois and the Piankeshaw nations; and the question is, whether this title can be recognised [sic] in the Courts of the United States?").

41 21 U.S. at 577. Marshall discusses various charters such as the ones granted to Sir Humphrey Gilbert and Sir Walter Raleigh and one made by King James I. *Id.* at 577. Other charters were granted to the Plymouth Company and Lord Clarendon. *Id.* at 578-89. Marshall asserts,

> Thus has our whole country been granted by the crown while in the occupation of the Indians. These grants purport to convey the soil as well as the right of dominion to the grantees. In those governments which were denominated royal, where the right to the soil was not vested in individuals, but remained in the crown, or was vested in the colonial government, the king claimed and exercised the right of granting lands, and of dismembering the government at his will.

Id. at 579.

Marshall further discussed conflicting European claims which "produced a long and bloody war, which was terminated by the conquest of the whole country east of the Mississippi." *Id.* at 583. Marshall continued with a discussion of European treaties. "In the treaty of 1763, France ceded and guarantied [sic] to Great Britain, all Nova Scotia, or Acadie, and Canada." *Id.* Marshall then completed the transfer of rights from European charters to American sovereignty. He stated that due to the treaty with Britain after the American Revolution, "the powers of government, and the right to soil, which had previously been in Great Britain, passed definitively to these States." *Id.* at 584.

42 21 U.S. at 588.

> The power now possessed by the government of the United States to grant lands, resided, while we were colonies, in the crown, or its grantees. The validity of the titles given by either has never been questioned in our Courts. It has been exercised uniformly over territory in possession of the Indians.

Id. at 588.

43 The United States "maintain, as all others have maintained, that discovery gave an exclusive right to extinguish the Indian title of occupancy, either by purchase or by conquest; and gave also a right to such a degree of sovereignty, as the circumstances of the people would allow them to exercise." 21 U.S. at 587.

44 "But the tribes of Indians inhabiting this country were fierce savages, whose occupation was war, and whose subsistence was drawn chiefly from the forest. To leave them in possession of their country, was to leave the country a wilderness." 21 U.S. at 590.

45 Marshall refers to native people as "fierce savages, whose occupation was war." *Id.* Marshall also states when Europeans came to the Americas, "the character and religion of its inhabitants afforded an apology for considering them as a people over whom the superior genius of Europe might claim an ascendency." *Id.* at 573.

sovereignty in space, but there are many other implications the case could have. *Johnson* has not been overturned and, therefore, the legal themes still govern in the United States today.[46] It is possible that the charter system that aided modern colonialism could resurface in a new form, this time created and authorized by governments rather than monarchs. Nations may authorize companies to colonize land in their name,[47] akin to royals charging individuals like Christopher Columbus to discover and conquer on their behalf.[48] Countries could divvy up planets by treaty, as happened in the Americas.[49] The charter system, bolstered by the common law doctrines of Discovery and Conquest, could see a rush for land and resources in space. Aided by technology, Discovery is as easy as it has ever been.[50]

Conquest, alternatively, may seem like an archaic method of creating property. It may invoke colonial imagery that seems out of place in today's world. Yet, Conquest is arguably occurring in different forms across the planet at this very moment.[51] Unfortunately, there is little reason to

46 Given that *Johnson v. M'Intosh* is cited in a relatively recent United States Supreme Court case and used to support the conclusions of the Court, it is apparent that the case is still good law in the United States. County of Oneida v. Oneida Indian Nation, 470 U.S. 226, 235 (1985).

47 Space X already has a strong commercial relationship with NASA and, therefore, the United States government. Carter, *supra* note 18. Blue Origin has also attempted to procure a United States government contract. Kay, *supra* note 27. If the United States government has authorized private companies to help conduct NASA missions such as the Artemis missions, then it may engage with private companies to create and deploy space habitats for NASA. This is not quite the same as European royals granting charters to their agents to add new territory to their empires, but it may be the modern commercial equivalent. *Id.*

48 *Privileges and Prerogatives Granted by Their Catholic Majesties to Christopher Columbus: 1492*, *supra* note 35.

49 *See* Johnson v. M'Intosh, 21 U.S. 543, 577 (1823). The mechanism by which countries would act in such a manner would likely be different from the charter system. Without monarchies to derive divine or supreme authority, governments may instead choose to use contractual commercial relationships like they have to conduct space missions, to convey rights in space, including property rights. *See supra* notes 18-19 and accompanying text.

50 *See supra* note 90 and accompanying text.

51 In Russia's current war on Ukraine, scholars have directly compared current actions to past colonial policies: "Eastern European scholars emphasize a direct link between Soviet imperial-colonial genocidal policies in 1930s Ukraine and Putin's current actions." Patryk I. Labuda, *Countering Imperialism in International Law: Examining the Special Tribunal for Aggression Against Ukraine Through a Post-Colonial Eastern European Lens*, 49 YALE J. INT'L L. (forthcoming 2023) (manuscript at 15) (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4518498). At the time of this writing, Russian forces in Ukraine controlled much of Donetsk, Luhansk, and Crimea: "Russia currently controls about 18 percent of Ukraine. That area includes much of the Donetsk and Luhansk Provinces in the east, as well as Crimea, which it illegally annexed in 2014." Scott Reinhard, *Ukraine Has Reclaimed More Than Half the Territory Russia Has Taken This Year*, N.Y. TIMES (Nov. 14, 2022), https://www.nytimes.com/interactive/2022/world/europe/ukraine-maps.html. According to Amnesty International, Israel has over 600,000 settlers living and building homes and infrastructure in Palestine: "Despite multiple UN resolutions, Israel has continued to appropriate Palestinian land and support at least 600,000 settlers living in the occupied West Bank, including East Jerusalem." *Israel's Occupation: 50 Years of Dispossession*, AMNESTY INT'L (June 7, 2017), https://www.amnesty.org/en/latest/campaigns/2017/06/israel-occupation-50-years-of-dispossession/. "In recent months, Israel has accelerated settlement expansion. The government has announced plans for thousands of new homes in existing settlements, as well as the establishment of two new settlements in the occupied

think space is so sacred that weapons, war, and Conquest will not eventually occur with a large-scale human presence.

c. Terra Nullius

Terra nullius is Latin for 'land of no one.' It was a legal doctrine that, until 1992, provided the justification for the British colonization of Australia.[52] Even without actual vacancy, land could be claimed under the doctrine.[53] Since the first British expedition,[54] and until *Mabo v. Queensland* rejected the doctrine,[55] it remained the law of Australia.[56] Today in Australian law, Aboriginal and Torres Strait Islander people must prove "an 'ongoing' connection to their traditional lands" to claim native title.[57]

West Bank." *Id.* James J. Friedberg, a professor at West Virginia University College of Law, has noted that "Israel has both displaced Palestinians from their homes and transferred Israelis to settlements," and that "[g]enerally, [the settlements] are illegal." James J. Friedberg, *International Law, Settlements and the Two-State Solution*, 24 PALESTINE-ISR. J. 54, 58, 60 (2019), https://researchrepository.wvu.edu/cgi/viewcontent.cgi?article=2117&context=faculty_publications. The Islamic State still occupies portions of Iraq and Syria: "Even if the Islamic State no longer has the power to control a swath of territory the size of Britain, as it did in Iraq and Syria until 2019, the terrorist group has shown that it can still carry out devastating coordinated military attacks." Hwaida Saad et al., *U.S. Forces Kill Senior ISIS Leaders in Syria, Officials Say*, N.Y. TIMES (Oct. 6, 2022), https://www.nytimes.com/2022/10/06/world/middleeast/isis-leader-syria-us-raid.html.

52 "The concept of *terra nullius,* or land belonging to no-one, remained the legal principle on which British colonisation rested until 1992, when the High Court brought down its finding in the *Mabo v. Queensland (No. 2)* case." *Challenging Terra Nullius*, NAT'L LIBR. OF AUSTL., https://www.nla.gov.au/digital-classroom/senior-secondary/cook-and-pacific/cook-legend-and-legacy/challenging-terra (last visited Mar. 26, 2024). "In recognising that native title had always existed, the Mabo ruling set a precedent in Australian law, which has now seen numerous Aboriginal and Torres Strait Islander groups regain rights over their traditional lands." *Id.*

53 *Challenging Terra Nullius*, *supra* note 52.

54 Captain James Cook set sail for the Royal Society of London and the British Admiralty to find the "Great South Land." *Secret Instructions*, NAT'L LIBR. OF AUSTL., https://www.nla.gov.au/digital-classroom/senior-secondary/cook-and-pacific/indigenous-responses-cook-and-his-voyage/secret (last visited Mar. 26, 2024). Cook was told, "with the Consent of the Natives to take possession of Convenient Situations in the Country in the Name of the King of Great Britain." *Id.* Cook eventually reached the eastern shore of Australia, the so called "Great South Land," and claimed the continent for the British Crown. *Id.*

55 Justice Brennan of the High Court of Australia set forth the rejection of *terra nullius*:

> The common law of this country would perpetuate injustice if it were to continue to embrace the enlarged notion of terra nullius and to persist in characterizing the indigenous inhabitants of the Australian colonies as people too low in the scale of social organization to be acknowledged as possessing rights and interests in land. Moreover, to reject the theory that the Crown acquired absolute beneficial ownership of land is to bring the law into conformity with Australian history. The dispossession of the indigenous inhabitants of Australia was not worked by a transfer of beneficial ownership when sovereignty was acquired by the Crown, but by the recurrent exercise of a paramount power to exclude the indigenous inhabitants from their traditional lands as colonial settlement expanded and land was granted to the colonists.

Mabo v. Queensland [No. 2] (1992) 175 CLR 1, ¶ 63 (Austl.).

56 *Challenging Terra Nullius*, *supra* note 52.

57 "In Australian law today, Aboriginal and Torres Strait Islander people wishing to claim native title must prove an 'ongoing' connection to their traditional lands since the time of British possession." *Id.*

The case in *Mabo* dealt with the Murray Islands in the Torres Strait and the Meriam peoples' rights to the Islands.[58] Justice Brennan analyzed the history of *terra nullius*[59] and its application to the land in Australia that is claimed under its doctrine.[60] Justice Brennan recognized the injustices of the *terra nullius* doctrine. He then concluded that the Meriam peoples' title to the Murray Islands was not extinguished by the claim of sovereignty from the British Crown.[61]

Unfortunately, the *Mabo* case did not come without stipulations on native title.[62] Although the doctrine of *terra nullius* was rejected, the reality of the court's decision left much of the colonial impact intact.[63] Additionally, the argument against *terra nullius* outlined in the case is premised on the preexistence of native title and is left to a case-by-case analysis.[64] This leaves room to claims of sovereignty under *terra nullius*

58 "The Murray Islands lie in the Torres Strait. . . . The people who were in occupation of these Islands before first European contact and who have continued to occupy those Islands to the present day are known as the Meriam people." *Mabo v. Queensland [No. 2]* (1992) 175 CLR 1, ¶ 1 (Austl.). "In this case, the legal rights of the members of the Meriam people to the land of the Murray Islands are in question." *Id.*

59 "International law recognized conquest, cession, and occupation of territory that was terra nullius as three of the effective ways of acquiring sovereignty." *Mabo v. Queensland [No. 2]* (1992) 175 CLR 1, ¶ 33 (Austl.). Brennan described European justifications for *terra nullius*. "[European nations] recognized the sovereignty of the respective European nations over the territory of 'backward peoples' and, by State practice, permitted the acquisition of sovereignty of such territory by occupation rather than by conquest." *Id.* Some other justifications Brennan mentions were the "benefits of Christianity and European civilization" and that "Europeans had a right to bring lands into production if they were left uncultivated by the indigenous inhabitants." *Id.*

60 Brennan stated that the law of Australia rejected the proposition that "when the Crown acquired sovereignty over territory which is now part of Australia it thereby acquired the absolute beneficial ownership of the land therein" and the law "accepts that the antecedent rights and interests in land possessed by the indigenous inhabitants of the territory survived the change in sovereignty." *Mabo v. Queensland [No. 2]* (1992) 175 CLR 1, ¶ 62 (Austl.).

61 Brennan left the possibility that native title could be extinguished by voluntary cession or by purchase, but distinguished the Meriam people. *Mabo v. Queensland [No. 2]* (1992) 175 CLR 1, ¶ 67 (Austl.). "The Meriam people asserted an exclusive right to occupy the Murray Islands and, as a community, held a proprietary interest in the Islands. They have maintained their identity as a people and they observe customs which are traditionally based." *Id.* The final order of the case states that "the land in the Murray Islands is not Crown land." *Id.* at Order ¶ 1.

62 Brennan's conclusions on native title included exceptions. For example, native title that Aboriginal groups were "entitled to enjoy under the laws and customs of [the group] is extinguished if the clan or group, by ceasing to acknowledge those laws, and . . . observe those customs, loses its connection with the land or on the death of the last of the members of the group or clan." *Mabo v. Queensland [No. 2]* (1992) 175 CLR 1, ¶ 83, § 7 (Austl.).

63 Although the order denied Crown claims to the Murray Islands, the order still claimed the native title of the Meriam people was still "subject to the power of the Parliament of Queensland and the power of the Governor in Council of Queensland to extinguish that title by valid exercise of their respective powers, provided any exercise of those powers is not inconsistent with the laws of the Commonwealth." *Id.* at Order ¶ 3.

64 Brennan's argument acknowledges the difficulties of proving native title. He states, "since European settlement of Australia, many clans or groups of indigenous people have been physically separated from their traditional land and have lost their connexion with it. But that is not the universal position. It is clearly not the position of the Meriam people." *Mabo v. Queensland [No. 2]* (1992) 175 CLR 1, ¶ 66 (Austl.). Brennan clearly separates the Meriam people from other Aboriginal groups that have "lost their connection." But Brennan did not describe what qualifies a lost connection or how groups could prove a sufficient connection. He only distinguishes the Meriam

where there is no preexisting native title. Uninhabited planets and moons would therefore not face the same *terra nullius* scrutiny as the Meriam people in *Mabo*. Applying *terra nullius* to land that, for now, truly belongs to no one, may be a palatable option for some countries.

III. CURRENT SPACE TREATIES AND AGREEMENTS

To understand the future of legal rights in space, the current landscape of space law must be addressed. The Outer Space Treaty is the first of five major treaties on outer space passed by the United Nations ("UN").[65] It was a UN resolution adopted in 1967,[66] and signed and ratified by various major space-faring countries including the United States, United Kingdom, and Russia.[67] The foundational rules of the Treaty include prohibitions on claims of national sovereignty, use of nuclear weapons, and use of weapons of mass destruction in outer space.[68] It also required that the Moon and other celestial bodies be used only for peaceful purposes, created liability for nations that caused damage in outer space, and stated that nations should avoid harmful contamination.[69] The Treaty was written in the heart of the Cold War space race and, therefore, has provisions very specific to that context, like the nuclear

people from the abstract groups that have "lost their connection." The lack of acknowledgement of the rights of indigenous people separated from their original land shows the shortcomings of legal changes that are intended to reverse consequences of colonialism. It also shows the vulnerability still facing Aboriginal groups that contend with colonial legal doctrines.

65 "The Committee on the Peaceful Uses of Outer Space is the forum for the development of international space law. The Committee has concluded five international treaties and five sets of principles on space-related activities." *Space Law Treaties and Principles*, U.N. OFF. FOR OUTER SPACE AFFS., https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties.html (last visited Mar. 26, 2024).

66 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

67 *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, U.N. OFF. FOR DISARMAMENT AFFS., https://treaties.unoda.org/t/outer_space/participants (last visited Mar. 26, 2024).

68 "Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." Outer Space Treaty, *supra* note 66, art. II. "States Parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner." *Id.* art. IV.

69 "The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden." Outer Space Treaty, *supra* note 66, art. IV. Each state that is party to the treaty which "launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty." *Id.* art. VII. "States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter." *Id.* art. IX.

weapons provision.[70] However, the general requirements of the Treaty create a basic framework in which to understand how nations operate in space.

The Outer Space Treaty was supplemented by the Moon Agreement, a UN resolution written in 1979 and adopted in 1984.[71] The Agreement reinforces the Outer Space Treaty and supports among other things, freedom of scientific investigation,[72] preservation of the natural environment,[73] and creation of stations that only take as much space as necessary.[74] The Agreement contains strong language, stating "[t]he moon and its natural resources are the common heritage of mankind."[75] Most relevantly for our purposes, the Agreement states that occupation, habitation, and construction on the Moon do not create property rights over any part of it.[76] The Agreement also requires establishment of an international regulatory mechanism by nations subject to the Agreement once natural resource exploitation becomes possible.[77] There is powerful

70 The idea of nuclear weapons in space was born out of Cold War era politics. In addition to the possibility of nuclear weapons in orbit, as "the same rockets that launched satellites could be armed as missiles. . . . Cold War-era strategists argued that nuclear weapons needn't be limited to a space station." Fred Nadis, *Nukes on the Moon: When the Atomic Age Met the Space Age*, ASTRONOMY (May 18, 2023), https://astronomy.com/magazine/news/2022/03/when-the-atomic-age-met-the-pace-age. In fact, "in 1959, the U.S. Army developed Project Horizon, a plan for a Moon base that would house scientists and, potentially, nuclear missiles." *Id.* Fortunately, President Eisenhower "not only rejected Project Horizon, but questioned the strategic value of any nuclear weapons in space." *Id.* These discussions are the essential context of these Cold War-era space treaties.

71 The Moon Agreement "was adopted by the General Assembly in 1979 in resolution 34/68. It was not until June 1984, however, that the fifth country, Austria, ratified the Agreement, allowing it to enter into force in July 1984." *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, U.N. OFF. FOR OUTER SPACE AFFS., https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html (last visited Mar. 26, 2024).

72 "There shall be freedom of scientific investigation on the moon by all States Parties without discrimination of any kind, on the basis of equality and in accordance with international law." Agreement Governing the Activities of States on the Moon and Other Celestial Bodies art. 6, Dec. 18, 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].

73 "In exploring and using the moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment, whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise." *Id.* art. 7.

74 "States Parties may establish manned and unmanned stations on the moon. A State Party establishing a station shall use only that area which is required for the needs of the station." *Id.* art. 9.

75 Moon Agreement, supra note 72, art. 11.

76 "Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non- governmental organization, national organization or non-governmental entity or of any natural person." *Id.* This language rejects the exploitation of not just land on the Moon but its resources as well. The Agreement also removes other vehicles for creation of a property interest. "The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the moon, including structures connected with its surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof." *Id.*

77 "Parties to this Agreement hereby undertake to establish an international regime, including appropriate procedures, to govern the exploitation of the natural resources of the moon as such exploitation is about to become feasible." Moon Agreement, supra note 72, art. 11. It is notable that the Moon Agreement placed an emphasis on international property regimes very early in space

language here about property rights and international cooperation,[78] which seems to alleviate some of the concerns of space colonization, at least as applied to countries, but there is one major issue with the Moon Agreement as compared to the Outer Space Treaty. As of now, most of the major space-faring countries have neither signed nor ratified the Treaty, including the United States, the United Kingdom, Russia, and China.[79]

A major, recent development in international space law was the signing of the Artemis Accords in 2020.[80] Although the Accords are non-binding,[81] it introduces several new concepts to international space law, such as notification of space activities and the establishment of safety zones.[82] This certainly looks like a promising step in the coordination of international space activities, but the Artemis Accords contain several potentially fatal flaws. The first is adoption: as with previous space agreements, several key actors in space, including Russia and China, are missing from the list of signatories.[83] There are other potential issues with the document itself. The Accords' generous and controversial[84]

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exploration. It is true that this recognition is more about natural resources than land and other forms of property, but this acknowledgement shows how important and long-lasting the dialogue about space property regimes will be. This places the parties to the Agreement in an interesting position in the next few decades. As previously discussed, many countries are attempting lunar missions in the next few years, some of which, like the Artemis missions, will attempt to create permanent bases. It is not clear when the language of the Agreement requires the creation of an international regime, however it is arguable that exploitation is about to become feasible, if not now, in the very near future.

78 *Supra* notes 76-77 and accompanying text.

79 *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, U.N. OFF. FOR DISARMAMENT AFFS., https://treaties.unoda.org/t/moon/participants (last visited Mar. 26, 2024). India has signed the agreement, although they have not ratified it. *Id.* Several European countries that have signed and ratified the agreement like Austria and the Netherlands, are also members of the European Space Agency ("ESA"). *Id. Member States & Cooperating States*, EUR. SPACE AGENCY, https://www.esa.int/About_Us/Corporate_news/Member_States_Cooperating_States (last visited Mar. 26, 2024). However, as there is such low participation among member states, the ESA likely wouldn't be subject as a whole to the Moon Agreement. *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, *supra* note 79.

80 "[T]he Artemis Accords were launched on October 13, 2020 with Australia, Canada, Italy, Japan, Luxembourg, the United Arab Emirates, the United Kingdom and the United States." *Artemis Accords*, U.S. DEP'T STATE, https://www.state.gov/artemis-accords/ (last visited Mar. 26, 2024).

81 *Id.*

82 Signatories to the Artemis Accords agree in Section 11 to provide notification to, and coordinate with, other "relevant actor[s]" regarding their activities, as well as establish temporary safety zones. NASA, THE ARTEMIS ACCORDS § 11 (2020), https://www.nasa.gov/wp-content/uploads/2022/11/Artemis-Accords-signed-13Oct2020.pdf?emrc=653a00.

83 Current Artemis Accords signatories as of February 2024 include:

> Angola, Argentina, Australia, Bahrain, Belgium, Brazil, Bulgaria, Canada, Colombia, Czech Republic, Ecuador, France, Germany, Greece, Iceland, India, Israel, Italy, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Nigeria, Poland, the Republic of Korea, Romania, Rwanda, Saudi Arabia, Singapore, Spain, Ukraine, the United Arab Emirates, the United Kingdom, the United States, and Uruguay.

Artemis Accords, *supra* note 80.

84 "Dmitry Rogozin, the head of Russia's space program, has made it very clear that he is not a fan of the accords or of NASA's Artemis program. When NASA first announced the accords [sic],

interpretation of the Outer Space Treaty in Section 10 explicitly allows for extraction of resources from "the Moon, Mars, comets, or asteroids,"[85] stating that such extractions do not "inherently constitute national appropriation under Article II of the Outer Space Treaty."[86] If the Accords will allow space mining, they must develop a more comprehensive regime for countries to coordinate as notice alone is not enough. There is also little clarity on how resource extraction weighs against the provisions of the Outer Space Treaty, such as prevention of harmful contamination. However, the Accords should be applauded at least for its global reach, amassing thirty-six signatories including a new major player in India.[87]

IV. DESIGNING A SPACE PROPERTY REGIME

a. Important Factors

The longest a human has been in space continuously is 438 days, a feat accomplished by cosmonaut Valery Polyakov.[88] Although it is hard to fathom the future reality of our species, it is certainly possible that future humans will be born, live, and die without ever setting foot on Earth. How far humanity will go in the cosmos is, of course, uncertain. However, space colonization is an ever-closer reality. In a universe where most, if not all, of humanity lives off-Earth, our development of space property will be key in determining how that future society operates.

The doctrines of Discovery and Conquest are foundational to the traditional systems of colonization, but attempting to apply them to modern space colonization proves difficult. First of all, as common law doctrines,

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Rogozin likened it to a lunar 'invasion.'" Loren Grush, *US and Seven Other Countries Sign NASA's Artemis Accords to Set Rules for Exploring the Moon*, VERGE (Oct. 13, 2020, 11:37 AM), https://www.theverge.com/2020/10/13/21507204/nasa-artemis-accords-8-countries-moon-outer-space-treaty. Independent scholars also voiced their objection to the Accords' interpretation of national appropriation in the Outer Space Treaty, which does not include resource extraction as a form of appropriation. "A pair of researchers writing in the journal *Science* last week have called on countries to speak up about their objections to this interpretation, and that the United States should go through the United Nations treaty process in order to negotiate on space mining." *Id.*

85 THE ARTEMIS ACCORDS, *supra* note 82, § 10. The Accords do state that resource extraction must comply with the other provisions of the Outer Space Treaty, which does extend other protections under the Treaty, such as prevention of harmful contamination. *Id.* Despite this, it is unclear how harmful contamination is balanced against extraction of resources.

86 THE ARTEMIS ACCORDS, *supra* note 82.

87 *Artemis Accords*, *supra* note 80.

88 "The world record for the single longest mission by any space explorer, man or woman, is held by cosmonaut Valery Polyakov, who spent 438 consecutive days on board Russia's former space station Mir from January 1994 to March 1995." Robert Z. Pearlman, *Astronaut Christina Koch Breaks Record for Longest Space Mission by a Woman*, SPACE.COM (Dec. 28, 2019), https://www.space.com/nasa-astronaut-christina-koch-breaks-female-spaceflight-record.html. The record for most total time in space is 878 days held by cosmonaut Gennady Padalka. *Id.*

they will be applied differently by different states. Modern space exploration almost necessitates cooperation. If there was to be a modern charter system that created property rights in discovered territory in space, the system would be rife with conflict. The mapping and observation technology of today far surpasses that of the colonial era. Where past sovereigns would send out representatives with loose instructions and little more than hope,[89] current technology allows far more precision.[90] This presents competition issues for countries and companies. If there are certain spots known to have abundant resources,[91] there would be a race to grant or receive charters, to launch and 'discover' the area, and to stake a claim to it.

Discovery also looks different in the era of probes and satellites. A country discovering an area that another country has already landed in would create conflict. It seems the doctrine itself inevitably leads to conflict, oftentimes violent ones, as in the case of the European powers laying claim to parts of the Americas.[92] The doctrine of Conquest seems to comport with the possibility of conflict as it deems the winner to be the true owner of the disputed land. But this does not cohere with the peaceful requirements of the Outer Space Treaty.[93] Where Chief Justice Marshall may have seen the doctrine as a means to an end,[94] international

89 *Privileges and Prerogatives*, *supra* note 35. Columbus operated on a charter that was granted not based on specific locations, unlike a later charter by James I. *The Charter of New England: 1620*, *supra* note 36. Both of these charters are still very imprecise compared to what would be capable today.

90 The James Webb Space Telescope can see as far as 13.6 billion light years away from Earth, the farthest anyone has seen. Jeffrey Kluger, *These 5 Photos From the James Webb Space Telescope Are Mind-Blowing. Here's What They Can Tell Us*, TIME (July 13, 2022, 1:29 PM), https://time.com/6196675/five-james-webb-telescope-images-explained/. Although human colonization will probably not happen at such a distance, the detail in which telescopes, probes, and rovers can observe nearby planets and moons will provide an accurate idea of where to colonize, if not how.

91 The Luxembourg Space Agency sees the potential in bodies of space containing "a rich diversity of minerals, gases and water that could be used to provide raw materials, energy and sustenance to sustain human life and enable exploration deeper into space." *Resources in Space*, LUX. SPACE AGENCY (June 17, 2020), https://space-agency.public.lu/en/space-resources/ressources-in-space.html. This is not limited to far-flung planets, as "[a]nalysis of the Moon and the 400 kilos of lunar rock and regolith surface material already brought back to Earth indicate that it is rich in important and useful elements," and the agency predicts "[m]ining space resources may well come surprisingly quickly." *Id.*

92 Johnson v. M'Intosh, 21 U.S. 543, 577 (1823).

93 Outer Space Treaty, *supra* note 66, art. IV.

94 In *Johnson*, Marshall did appear contrite in his usage of conquest as a colonial justification.

> However extravagant the pretension of converting the discovery of an inhabited country into conquest may appear; if the principle has been asserted in the first instance, and afterwards sustained; if a country has been acquired and held under it; if the property of the great mass of the community originates in it, it becomes the law of the land, and cannot be questioned… However this restriction may be opposed to natural right, and to the usages of civilized nations, yet, if it be indispensable to that system under which the country has been settled, and be adapted to the actual condition of the two people, it may, perhaps, be supported by reason, and certainly cannot be rejected by Courts of justice.

agreements and treaties, like the Outer Space Treaty, are far more attractive instruments in promoting cooperation and reducing conflict.

Terra nullius may seem attractive where, unlike in Australia, nearby space does not have known current inhabitants. However, as the Outer Space Treaty shows, claiming sovereignty over land in space is so mutually undesirable that countries agree to refrain from it.[95] But why shouldn't nations and their agents try to claim sovereignty over land in space, as many did in the colonial era? They, after all, would not have to contend with the destruction of native peoples and cultures. Countries could agree to disrupt the colonial tradition of property rights when it comes to space for varied reasons. Freedom of movement is a crucial one. The right to exclude that comes along with traditional property rights would prove problematic in space, where harsh conditions and technological realities limit the possibilities for spacefarers to explore and colonize. If there were limitations based in property rights, this would not only burden competing entities, but also the entity attempting to enforce those rights by expending valuable time and resources. The environment of space creates a necessity for efficiency that is shared by all who venture into it.

There is an additional collective interest in outer space that is reflected by international agreement. The Outer Space Treaty prescribes that interest for open scientific discovery and treatment of astronauts.[96] This would not be possible under a colonial property right system, where rights are determined by sovereignty and inclusion is not universal.

The best existing analogous framework for developing space law is the United Nations Convention on the Law of the Sea ("UNCLOS"). In fact, the language in that Treaty mirrors the treatment of outer space in the Outer Space Treaty, as the UNCLOS denies claims of sovereignty over the seabed.[97] Unlike the Artemis Accords, the UNCLOS has a built-

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21 U.S. at 591-92.

Whether Marshall viewed the extravagant pretentions of discovery and conquest as a necessary relic of the past or an unfortunate tool of the future are debatable, but he appears to find its use distasteful.

95 Outer Space Treaty, *supra* note 66, art. II.

96 The Outer Space Treaty calls for "freedom of scientific investigation in outer space" and reception of all astronauts as "envoys of mankind in outer space" that shall be rendered assistance if needed. Outer Space Treaty, *supra* note 66, art. I.

97 "No State shall claim or exercise sovereignty or sovereign rights over any part of the [seabed] or its resources, nor shall any State or natural or juridical person appropriate any part thereof." U.N. Convention on the Law of the Sea art. 137, ¶ 1, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter *UNCLOS*]. "Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means." Outer Space Treaty, *supra* note 66, art. II. The language in these treaties is very similar, both referencing appropriation and sovereignty. UNCLOS is a framework for a potential space property treaty that would expand on the Outer Space Treaty. It adds additional language such as references to resource rights and application to legal persons as well as real persons and nations. A possible explanation for

in "sophisticated dispute resolution mechanism."[98] However, disputes over waterways and resources in the Arctic spell out the necessity for a sophisticated mechanism, as well as the need for a robust and comprehensive regime that clarifies ambiguities.[99] The UNCLOS even established a commission to help resolve territorial disputes,[100] yet there are concerns over the commission's effectiveness without the consent of the parties in a dispute.[101] Another analog of UNCLOS to space law lies in the historical disputes over seabed mining. Akin to the dispute over space resource extraction in the Artemis Accords, some countries have claimed that the national appropriation prohibition on the seabed did not apply to mining.[102]

b. Enforcement

Given the broad implications of international space law and the necessity for universal compliance, the issue of enforcement is significant. The current framework for international space law is governed by five UN treaties, including the aforementioned Outer Space Treaty and the Moon Agreement.[103] These treaties and agreements set a binding

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why this language was not in the original Outer Space Treaty is that the drafters did not foresee companies and resource appropriation as necessary issues to address.

98 Henri Féron, *A New Ocean: The Legal Challenges of the Arctic Thaw*, 45 ECOLOGY L.Q. 83, 88 (2018). The mechanism "can force member states to accept third-party adjudication or arbitration of disputes regarding the interpretation or application of UNCLOS." *Id.*

99 The navigation regime in the Artic under UNCLOS is under dispute despite the mechanisms in place under the treaty. "The unavailability of UNCLOS compulsory settlement for clarifying the navigation regime of the [Northwest Passage] and [Northern Sea Route] suggests that the applicable navigation regime will in practice be dictated by Canada and Russia, assuming they refuse voluntary adjudication of the dispute." Féron, *supra* note 98, at 85, 97. There are also disputes over the seabed in the Arctic region. "Canada, Denmark, and Russia currently dispute ownership over the seabed of large parts of the central Arctic Ocean." *Id.* at 99.

100 "UNCLOS does require state parties to submit [Outer Continental Shelf] information to the [Commission on the Limits of the Continental Shelf] . . . ." Féron, *supra* note 98, at 102.

101 "[T]he [Commission on the Limits of the Continental Shelf] is meant to be an advisory body, only issuing 'recommendations' after evaluating the scientific validity of the [Outer Continental Shelf] claims." *Id.* "Ultimately . . . the CLCS recommendation may not represent the final word in the resolution of the dispute over the ownership of the central Arctic seabed. When states disagree on the delimitation of their continental shelves, the dispute generally cannot be resolved without the consent of all involved." *Id.* at 103.

102 "[T]he United States and a few other developed countries argue that the deep seabed is subject to the legal regime of the high seas and that seabed mining is lawful as a freedom of the high seas." Jon Van Dyke & Christopher Yuen, *"Common Heritage" v. "Freedom of the High Seas": Which Governs the Seabed?*, 19 SAN DIEGO L. REV. 493, 501 (1982).

103 Elina Morozova & Yaroslav Vasyanin, *International Space Law and Satellite Telecommunications*, PLANETARY SCI. 23 Dec. 2019.

> International space law is generally associated with the five UN treaties on outer space. The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty), being the first and the most fundamental, was approved by the UN General Assembly in 1966 and opened for signature and ratification in 1967. With more than hundred [sic] states parties, the Outer Space Treaty is the foundation of international space law.

framework; however, new developments in international space law have taken the form of non-binding UN resolutions.[104] It would be logical to assume that because of the shift from binding treaties to non-binding resolutions, compliance has become significantly weaker in the area of space law. However, states have, in most respects, adhered to these resolutions without the force of a binding agreement.[105]

Given the history of space treaties and agreements in the UN, and the foundational role those treaties play within international space law, the UN is the first candidate for implementing and enforcing an overarching space property regime. The general compliance with even non-binding space resolutions by member states shows that UN regimes carry weight in space law even without wide adoption.[106] Regardless, a binding treaty in the vein of the Outer Space Treaty would be the optimal method for creating space property regulations.

UN treaties ratified by member states, including the major space-faring nations,[107] would apparently solve the issue of cooperation between countries. However, gaining cooperation of companies may be just as important. After all, SpaceX and Blue Origin have launched manned spaceflights, meaning that companies have achieved that feat nearly equal to the number of countries that have done the same.[108] Any agreement between countries would be ineffective as a practical instrument if companies were not bound by its terms as well. The question of company

Id. (internal citation omitted).

104 "The Moon Agreement was ratified by the least number of states, including few space powers, and marked the end of the development of international space law through binding instruments. Since then, international space law evolved through non-binding instruments adopted by the UN General Assembly Resolutions." Morozova & Vasyanin, *supra* note 103 (internal citation omitted).

105 "Despite the non-binding nature of these instruments, states have largely complied with them, among other things, through incorporation in national legislations." *Id.*

106 The exact reasons for general compliance may be separate from the member states' view of the UN as an enforcement vehicle, however this is still strong evidence that the UN scheme of regulation for space property could be similarly ubiquitous. This contention is strengthened by the notion that compliance to a UN space property regime could be enforced by binding treaty, similar to the Outer Space Treaty.

107 China joined the United States and Russia (Soviet Union) as the countries that have launched manned spaceflights. Konstantin Kakaes, *International Collaborations in Space Always Reflect Politics on Earth*, SLATE (Mar. 30, 2017, 9:00 AM), https://slate.com/technology/2017/03/a-brief-history-of-the-countries-that-send-people-to-space-and-why.html. However, that list may grow as countries such as India attempt to expand their space programs. India plans to launch their own manned spaceflights after unmanned missions to the Moon and Mars. Amitabh Sinha, *Gaganyan: How to Send an Indian into Space,* INDIAN EXPRESS (Aug. 16, 2018) https://indianexpress.com/article/explained/simply-put-how-to-send-an-indian-into-space-isro-maned-mission-5308964/. As more countries join the space fervor and manned spaceflight becomes more feasible and frequent, ratification by China and India of a potential treaty may be as important as gaining signatories among the more traditional space powers.

108 SpaceX achieved manned spaceflight in 2020. Clark, *supra* note 12. Blue Origin followed shortly afterwards with their own manned spaceflight in 2021. *Blue Origin Safely Launches Four Commercial Astronauts to Space and* Back, *supra* note 15. China, Russia, and the United States are the three countries to have achieved manned spaceflight. *Supra* note 107 and accompanying text.

liability and obligations under international law does not have obvious answers.[109] However, there are UN treaties that do impose obligations on companies.[110] One treaty, the UNCLOS, directly regulates the property rights that companies can assert over the seabed and minerals underneath.[111] Therefore, a UN treaty could sufficiently cover nations, companies, and individuals.

The UN may additionally choose to create or incorporate a specialized agency that purely deals with space property claims and rights, especially since it has made specialized agencies before.[112] The United Nations Office for Outer Space Affairs is already a UN agency that deals with space matters,[113] but as more permanent residential and industrial installations are built in space, land and resource management may become such an issue that a specialized space property agency would be necessary to manage an international property regime.

An additional factor in enforcement is the issue of incentives. The idea of "the tragedy of the commons" deals with conflicting incentives

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109 "In international law, there is no general rule that companies are responsible for their internationally wrongful acts. For obvious reasons it cannot be assumed that companies have the same obligations as states or even as individuals, even if developments appear to go in that direction." MENNO T. KAMMINGA, CORPORATE OBLIGATIONS UNDER INTERNATIONAL LAW 423 (2004). "Multilateral treaties generally impose obligations on *states*, not on *companies*." *Id.* at 424. Because states, and not companies, are signatories to international treaties, any assumptions of imposed obligations on companies may be reliant on countries self-policing their own companies. This may lead to inconsistencies and perhaps lax enforcement or even nonenforcement. Companies that primarily operate in spaceflight may even choose to base themselves in countries with favorable regulation and enforcement of international space laws.

110 Kamminga notes that,

> [S]ome long-standing multilateral treaties do directly impose obligations on companies. The 1969 Convention on Civil Liability for Oil Pollution Damage provides that the owner of a ship (which may be a company) shall be liable for any pollution damage caused by it. The 1982 UN Convention on the Law of the Sea prohibits not only states but also natural and juridical persons from appropriating parts of the seabed or its minerals.

KAMMINGA, *supra* note 109, at 424.

111 "No State shall claim or exercise sovereignty or sovereign rights over any part of the [seabed] or its resources, nor shall any State or natural or juridical person appropriate any part thereof. No such claim or exercise of sovereignty or sovereign rights nor such appropriation shall be recognized." *UNCLOS, supra* note 97, art. 137(1). Juridical persons here means non-natural legal persons. Corporations are juridical persons in that they have legal personhood without actual personhood. *Juridical Person*, DICTIONARY ARCHIVES TERMINOLOGY, https://dictionary.archivists.org/entry/juridical-person.html (last visited Mar. 26, 2024).

112 *UN System*, U.N., https://www.un.org/en/about-us/un-system (last visited Mar. 26, 2024).

> The UN specialized agencies are autonomous international organizations working with the United Nations. All were brought into relationship with the UN through negotiated agreements. Some existed before the First World War. Some were associated with the League of Nations. Others were created almost simultaneously with the UN. Others were created by the UN to meet emerging needs.

Id.

113 "The United Nations Office for Outer Space Affairs (UNOOSA) works to help all countries, especially developing countries, access and leverage the benefits of space to accelerate sustainable development." *Roles and Responsibilities*, UNOOSA, https://www.unoosa.org/oosa/en/aboutus/roles-responsibilities.html (last visited Mar. 26, 2024).

within common property.[114] Since each person is able to use the common property without penalty, the rational participant will choose to use the property and its resources as much as possible, as they know every other rational actor will be incentivized to do the same.[115] An underlying assumption in "the tragedy of the commons" is that there is no regulatory scheme in place to manage the property.[116] With a binding regulatory regime that ensures proper use and management of land and resources, states and companies would be more incentivized to participate, as that would mean they can share competitive resources with multiple countries because breaking the regime would not be allowed.[117] Given the expense in even attempting to build in space, states and companies would be incentivized to cooperate wherever possible to limit the costs of breaking the regime, such as trying to enforce their claims without the backing of an international agreement.

V. TENANCY IN COMMON: AN OLD SOLUTION TO A NEW PROBLEM

If colonial law is not a valid solution to the new era of space colonization, there must be a legal doctrine to replace it. Fortunately, there is already a common law doctrine that reflects the issues that international property law faces. It is a doctrine that could solve fundamental issues such as freedom of movement and the imposition of externalities on other participants in space travel.

Tenancy in common has several rules that create a joint interest in property and a framework to protect that interest.[118] Tenants in common are guaranteed equal and unfettered access to the entire property owned in common.[119] Tenants in common must attempt to protect the common

114 Garrett Hardin's article details the tragedy of the commons and uses the analogy of a pasture that is a commons. Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243, 1244 (1968). The rational herdsman will only think of their own utility by adding more animals to graze, as there is only a personal benefit to do so, although the commons will suffer as each rational herdsman adds more animals. *Id.*

115 Hardin, *supra* note 114, at 1244.

116 The tragedy of the commons in Hardin's example only talks of rational actors in a common space and does not mention an external regulatory mechanism. *See generally id.* If the "rational" decisionmaker has to consider an external regulatory force, their calculus is influenced by more than resource exploitation.

117 In this model, participation and cooperation leads to increased opportunity, because those that cooperate can share the opportunities of other actors. Once a scheme is in place, preventing violators from continued participation imposes an additional cost that the tragedy of the commons does not account for. *Id.*

118 The Supreme Court of Tennessee examined a tenancy in common issue under state statute. This case and statute will be an example framework for how tenancy in common typically works. *See generally* Headrick v. Carter, 897 S.W.2d 256 (Tenn. 1995).

119 The state statute in *Headrick* states that "[t]enants in common are jointly seized of the entire estate, each having an equal right of entry, and the possession of one is regarded as the possession of all until a disseisin of the others by actual ouster." *Id.* at 260.

interest in question[120] and are also allowed to collect payment from co-owners, called contribution, for necessary maintenance and repair of the property.[121]

In an analogous international regime, all member states and companies would be guaranteed freedom of access to outer space. States and companies would not only be liable individually for damage and non-compliance in space, but under tenancy in common, all members of the regime are required to pay contribution for necessary restoration to the natural environment of space.[122] This not only ensures that damage can be adequately addressed, but also incentivizes members to police other members for violations and damage caused by permanent settlement, which keeps the costs of the whole group to a minimum.

The international treaty required to enact such a system could also provide for a commission, like UNCLOS, or multiple commissions to tackle independent issues, such as free travel, authorization for mining, authorization for settlement, and trade. Learning from UNCLOS, this commission would need to have independent and binding authority, with representation from most—if not all—space-faring nations to ensure fairness. The commission could hear petitions and enforce fines and costs on noncompliant member states. To incentivize signing on to the treaty and complying with the framework, the treaty could institute a policy of noncooperation with noncompliant or non-signatory entities, whereas compliant members could receive full cooperation.

A tenancy in common based framework accurately represents the sentiments of the original Outer Space Treaty. That Treaty emphasized the importance of freedom of movement and common heritage in space.[123] The sense of care for space and the natural environment highlighted in the treaty reflect the need for a regime that creates a shared liability and method of enforcement. A scheme reliant on individual liability of states and companies may create incentives to avoid enforcement or circumvent legal liability for conduct. Shared responsibility encourages preventing harm, not only of the state or company in question,

120 The state statute in *Headrick* also creates duties between tenants in common. It states,

> [t]enants in common stand in a confidential relation to each other as to the joint property, and the same duties are imposed on them as if a joint trust were created by contract between them. In such case, the relation of trust and confidence between them binds all to put forth their best exertions to protect the common interest, and forbids the assumption of a hostile attitude by any of them towards the rest.

Id. at 259-60.

121 Another state supreme court case asserts that "a tenant in common is entitled to contribution for expenditures made for repairs which were necessary, when he acted in good faith and there was a substantial benefit to the premises." Lewis v. Latham, 79 So. 2d 811, 814 (Miss. 1955).

122 *Id.* Any state or company under this model could repair damage and pursue all other members for their share of contribution.

123 Outer Space Treaty, *supra* note 66.

but of all others. Shared ownership and liability lessen the burden of enforcement on the body as a whole and creates broad incentives for each member to ensure overall compliance.

VI. CONCLUSION

The vastness of space confronts any attempt at human regulation or control. Previous efforts, such as the Outer Space Treaty in 1966,[124] or the current Artemis Accords, will have to be updated and reformed to respond to emerging technologies and ideas. However, foundational documents like the Outer Space Treaty set values that should be reflected in any property framework, such as peace, freedom of exploration, and, perhaps the most important, the idea that space is the "the province of all mankind."[125] There is no singular antidote to resolving the issues of international space law, but as colonial common law doctrines show us, there are answers with damaging and longstanding effects. It is now up to the current and future generations of spacefarers and lawmakers to protect our common heritage.

Ishaaon Sivansh*

124 *Id.*

125 *Id.*

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