THE GLOBAL COMMONS: ANTARCTICA AND USE-RIGHTS

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Abstract: I outline an interpretation of the global commons designation from a theory of use-rights adapted from Samuel Pufendorf's work. I argue that the resource domains of the global commons, like Antarctic ice, should be understood as under a regime of global common ownership. That is, humanity has a set of limited claim rights to Antarctic resources. Normally, we might think that this would prevent individual agents from claiming parts of Antarctica as private property or as territorial rights. But I think this is a mistake. In most cases, crucial global resources like Antarctic ice can be administered by distinct territorial claimants and should not be subtracted from the territorial authority of existing holders.

Antarctica is the world's fifth largest continent, yet it remains virtually uninhabited. Its vast natural resources currently benefit humanity by stabilizing the oceanic temperatures and levels. It also contains natural reserves that are undiscovered or un-tapped. Because Antarctica is, for the most part, not subject to property or territorial rights, legal and political scholars argue that it is part of the *global commons,* areas beyond state territorial control that should fall under the common ownership of all of humanity.

Nevertheless, it is unclear what this designation means for an articulation of moral rights to the resources in the Antarctic.[1] In this paper I outline an interpretation of the global commons designation from a theory of use-rights adapted from Samuel Pufendorf's work. I argue that the resource domains of the global commons, like Antarctic ice, should be understood as under a regime of global common ownership. That is, humanity has a set of limited claim rights to Antarctic resources. Normally, we might think that this would prevent individual agents from claiming parts of Antarctica as private property or as territorial rights. But I think this is a mistake. In most cases, crucial global resources like Antarctic ice can be administered by distinct territorial claimants and should not be subtracted from the territorial authority of existing holders. However, this requires a better understanding of the nature of humanity's claims to globally important resources.

THE COMMONS VS. THE GLOBAL COMMONS

In philosophy, theories of the commons give us a moral map for how people can use and appropriate resources in the commons. These theories describe the moral relationship between persons and things in the *state of nature*, where persons live together without a joint set of conventional political laws. In the state of nature, people live under the laws of nature, moral laws that apply to all persons universally, regardless of their location or identity. The state of nature is a useful hypothetical tool; it helps us to identify the laws of nature that constrain conventional law. Because laws of nature still constrain systems of conventional law, the rules of the commons can apply to resources inside and outside of political territories.

Philosophers usually refer to the *commons* as an area containing unowned sets of resources. Humans have equal liberties to access and to use the commons, but this does not imply that others have any obligation regarding that liberty. So, a philosophical theory of the commons describes the set of rules that apply to resources that are not owned and are in the state of nature.

[1] Cara Nine, "Compromise and Original Acquisition: Explaining Rights to the Arctic," *Social Philosophy and Policy* 32, no. 01 (September 2015): 149–70, https://doi.org/10.1017/S0265052515000114.

Natural resources come in different types. Some resources can be extracted from their location and produce benefits. Others are *spatial-extension resources*, where the location itself is the benefit. For example, weather stations in the Antarctic have a unique vantage point for observing meteorological patterns that affect the Southern Ocean and surrounding climate systems. Resources can be located in fixed spatial dimensions called *resource domains.* Krill, an important dietary and ecological resource, are found in the resource domain of the Southern Ocean. Unique microbial resources are found in the resource domain of Antarctic ice.[2] Sometimes resources are contained in *resources systems*—these are resource wholes, like a freshwater reserve, from which portions of the resource can be extracted.

While the commons usually refers to the absence of property claims, the *global commons* refers to the absence of territorial claims. The global commons is a modified version of the commons that addresses resource domains and resource systems that lie beyond state territorial domains. The first task for assessing theories of the global commons is to identify what, exactly, counts as a global commons. Susan Buck describes a global commons as "resource domain to which all nations have legal access, such as outer space."[3] Like the commons, the global commons describes resource domains or systems that are internally complex. Typical examples of the global commons include the high seas, the atmosphere and Antarctica. Christopher Joyner, one of the most cited legal theorists writing about the global commons of Antarctica, expands Buck's legal definition to include normative criteria of the resource domain. Joyner's point is that labelling something as a global commons is not merely about its *current* international legal status. But rather, it should help us understand what its legal status *should be*. Specifically, Joyner argues that a global commons area should be conserved. Conservation is necessary because it preserves the beneficial effects of the global commons for humanity. On Joyner's view, a global commons is an area where the effects of use/management or abuse/mismanagement of the area are experienced universally.[4]

While the legal criterion picks out those areas that are not under state territorial jurisdiction, Joyner's additional criteria gives us clues as to which normative framework ought to apply to the area. For the most part, in this paper, I stick with this description of the global commons. A resource domain is a global commons where it meets both of these criteria:

1. All nations have legal access to the domain, and
2. The effects of use/management or abuse/mismanagement of the domain are experienced universally.

The major difference between the philosophical commons and the global commons is the criterion of universal effect—that the effects of use or management of the domain are experienced universally. This prompts theorists to argue that things in the global commons ought to stay in the global commons. The thought is that removing the domain from the possibility of being owned by a state or person is necessary to avoid mismanagement.

USE-RIGHTS

In this section, I present an interpretation of Pufendorf's account of use-rights in the philosophy commons. Starting from the philosophical commons, we can see the fundamental moral claims that

[2] Susan J. Buck, *The Global Commons: An Introduction* (Island Press, 1998), 3.
[3] Buck, 6.
[4] Christopher C. Joyner, *Governing the Commons: The Antarctic Regime and Environmental Protection* (Columbia, S.C.: University of South Carolina Press, 1998), 45. Joyner believes that the Antarctic should be governed by policies of conservation. He does not explicitly

individuals can make regarding the objects of their basic needs. Pufendorf's account situates persons equally with respect *to each other* in the commons, rather than claiming that persons have equal or reciprocal claims *to resources*. From this natural equality of persons, we can derive an initial justification for the obligations that correspond to natural use-rights.

A theory of the commons tells us which principles apply to rights over things that do not fall under more robust rights, like property or territorial rights. Since much of the world's stuff is divided into property or territory, we might be tempted to believe that the idea of the commons is no longer relevant. In fact, many of the Earth's most important resources are neither property nor held within a territory. The atmosphere, all of Antarctica, marine life and resources, and seabed resources are all arguably part of the commons. And more, theories of the commons help us to understand the purpose and limitations of property and territorial rights. On natural law theory, rights of property and territory should be consistent with the rights humans hold 'in common' to the Earth and its resources. Property and territorial rights do not replace rights that we have in the commons, but rather they grow from their foundation.

Philosophers usually refer to the commons as an area containing unowned sets of resources, and these are usually imagined to be under the moral rules of *state of nature.* In the state of nature, humans are still human. They have basic needs and desires to feed, flourish, to be safe, and to have relationships, and they need reliable access to space and resources to meet their needs. That humans need to have relationships with each other is important, because people live together—they live in communities and families. When people live near each other, they compete with their neighbours for similar resources. And this creates a fundamental problem for the state of nature: how can people live together, competing for space and resources, without political rule? Under political societies, we have systems of laws that tell us who can use which things for which purposes. But these systems of rights do not exist in the state of nature. This problem is repeated at the international level—when people in different territories do not share political systems of conventional law, and they share resources, what rules guide their behaviour? Some theorists, like Thomas Hobbes, say that there are no rules regarding common resources in the absence of a shared political society. Instead, every person has a right to anything.[5] According to Hobbes, people without political society act in ways only to further their own power and self-preservation, and this pursuit of self-interest without any rules characterizes our moral relationship in the commons.

Other philosophers are more optimistic about our potential to discern rules about the use of the commons in the state of nature. These theories give agents a moral map for how to legitimately use and appropriate resources in the commons. Theories of the commons describe the moral relationship between persons and things in the state of nature, where persons live together without a joint set of political laws. In the state of nature, people live under a set of rules called the laws of nature. The laws of nature apply to all persons universally, regardless of their location or identity. These natural laws set the foundation for all moral assessments of human behaviour.

One of Pufendorf's main contributions to the philosophy of the commons is his distinction between two kinds of commons: negative and positive. The original commons, argues Pufendorf, is a *negative commons*; nothing in the commons belongs to anybody in particular.[6] Things in the negative commons, "are not assign'd to any particular person, not that they are incapable of being so assign'd. They are likewise term'd *res in medio quibusvis expositae*, Things that lie free for any Taker."[7] Humans have equal liberties to access and to use the commons, and this does not include any claim rights

[5] Thomas Hobbes, *Leviathan* (Harmondsworth, Eng.: Penguin, 1986), bk. 1.14.10.
[6] Pufendorf, *DJN*, 290, 293, 298 (4.4.2, 4.4.5, 4.4.10).
[7] Samuel Freiherr von Pufendorf, *Of the Law of Nature and Nations: Eight Books*, trans. Basil Kennett (Oxford: Gale Ecco Print reproduction from British Library, 1710), bk. 4.4.2.1 (page 289).

corresponding to obligations in others regarding that use. In contrast, the *positive commons* is a state of common ownership, where a collection of people have claimed a set of resources together, and own it jointly. On a timeline, the Earth is first a negative commons, says Pufendorf. It is possible to create a positive commons, but this requires collective action; it is not the original natural state of the Earth.[8]

Starting from the negative commons, Pufendorf introduces three stages of rights over resources: natural liberties and powers, use-rights, and individual and collective property-rights (including Pufendorf's version of territorial rights). Use-rights are one stage on a sliding scale of progressively more robust rights, gradually taking things out of the negative commons. The first and most basic natural right to resources is a mere liberty, and we hold these mere liberties in the negative commons. With a mere liberty, each person has the right to access and to use the commons, but no person is under any obligation with regards to others' use of the commons. Included in this liberty is equal power. By exercising moral reason, we have moral powers. A moral power is the power to change or alter rights and obligations.[9] We can create rights and obligations, by making promises or entering into contracts and other relations. Because humans are the source of all special (created through human interaction) moral rights and obligations, the moral authority of these rights and obligations is constrained by the limits of our equal moral agency. Respecting individual capacity for autonomous moral agency is the most important element of respecting respect human equality.

Next, Pufendorf introduces use-rights that includes claims. Use-rights are justified because they are necessary to carry out the fundamental purpose of natural law: to ensure peace and self-preservation. We must have a way to justly use the commons to meet our basic needs.[10] Even when we have a liberty to use things, it is almost impossible to put them to use, if others might rightfully take them from us.[11] Thus, humans discern that they should accept certain obligations, corresponding to perfect rights held by others. These are use-rights. We do not have use-rights prior to interacting with the world. Use-rights must be acquired through action. We have a claim to continue using a resource and a corresponding obligation that no other person physically interferes with the right-holder's use of the item.[12] When an object is not incorporated into one's use, then this perfect right does not hold.[13]

In essence, humans have the power to create special rights and obligations over particular things. We each have this power equally, and together in groups we design systems that regulate these claims. Emergent systems of property rights created by social and political rules are justifiable as long as they are consistent with natural law.[14] This does not mean that use-rights and property rights are merely conventional. Natural law sets out a normative framework for acquiring use-rights and property rights. Within these rules and provisos, humans interact with each other and with their environment to construct particular systems that clarify and give specific content to these rights.

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[8] Pufendorf, bk. 4.4.2 (page 290-291); Cara Nine, "Rights to the Oceans: Foundational Arguments Reconsidered," *Journal of Applied Philosophy* 36, no. 4 (August 1, 2019): 626–42, https://doi.org/10.1111/japp.12340.

[9] Wesley Newcomb Hohfeld, *Fundamental Legal Conceptions*, ed. Walter Wheeler Cook (New Haven, Conn: Yale University Press, 1964).

[10] Stephen Buckle, *Natural Law and the Theory of Property: Grotius to Hume* (Oxford: Clarendon Press, 2002), 36.

[11] Mónica Brito Vieira, "Mare Liberum vs. Mare Clausum: Grotius, Freitas, and Selden's Debate on Dominion over the Seas," *Journal of the History of Ideas* 64, no. 3 (2003): 364, https://doi.org/10.2307/3654231; Buckle, *Natural Law and the Theory of Property*, 8–11. Richard Tuck, *Natural Rights Theories: Their Origin and Development* (Cambridge [England]; New York: Cambridge University Press, 1979), 62; Grotius, *The Rights of War and Peace*, 2005th, ed. Richard Tuck ed. (Indianapolis: Liberty Fund, 2005), bks. 2, Ch 2, sec 2, http://oll.libertyfund.org/titles/grotius-the-rights-of-war-and-peace-2005-ed-3-vols. Hugo Grotius, "Defense of Chapter V of the Mare Liberum [ca. 1615]," in *The Free Sea*, ed. David Armitage, trans. Richard Hakluyt, Natural Law and Enlightenment Classics (Indianapolis, IN: Liberty Fund, 2004), 83, 85.

[12] Pufendorf, *DJN*, 4.4.5.1; 4.4.10 (pp. 292, 298).

[13] Pufendorf, *DJN*, 290, 298 (4.4.2 and 10). With an exception made for the right of necessity. See below.

[14] Pufendorf, *DJN*, bk. 4.4.4.1. (page 291).

A use-right is usually described as a liberty to access and a claim to use a thing for one's own benefit. Although use-rights include the liberty to access an object being used, the explicit object of the right of access can be ambiguous. For example, to continue to use fresh water from the Colorado River, residents of Los Angeles do not need to access the banks of the river. Rights of access in this case can refer to continued access to the resources directly created by or causally resultant from the resource system of the Colorado. The residents of Los Angeles have a continued use-right to this resource system, to continue using a division of its resources or the direct causal results of its resources. But this does not necessarily entail their right to access the banks of the river. Similarly, humans have use-rights to the sun's solar energy, but this does not need to include rights to access the sun itself. Whether or not a use-right includes a liberty to access the object that produces the benefits (like the right to access the riverbanks of the Colorado), depends on whether the continued use of the resource depends on that particular liberty.

A use-right does not include the right to dispose of the thing as one pleases. In Elinor Ostrom's terminology, this means that a use-right does not include the right to 'alienate' a resource by selling, trading, or leasing. Nor does a use-right usually include the right to exclude others from the resource, except under certain conditions. When a person sets up their fishing gear at the riverbank, they have a use-right to that little section of the riverbank. They can use this section for their own benefit, to stand and to cast their fishing lines. While they are there using this section, they have an exclusive claim to its use as a fishing spot. Others have a corresponding obligation not to interfere with their use while it is ongoing. But the person cannot alienate this little section of riverbank —they can't sell it off for profit. And when they leave their spot to go home, they cannot exclude others from using it. This right is not a property right, because it does not include rights of alienation or strong exclusive rights.[15]

Despite the useful conceptual distinction between use and property rights, it may not be possible to always draw a bright line between them. Sometimes the two sets of cluster rights will bleed into each other. It seems possible to leverage use-rights to create property rights, for instance. The person fishing at a great spot on the river bank may permissibly take money in exchange for moving to a different spot.[16] Nevertheless, the distinction between use and property rights remains useful, because we can use the concept of use-rights to refer to rights that may be held legitimately without meeting the conditions for legitimately acquiring more robust property rights.

For Pufendorf, use-rights and property rights both are grounded in natural law, they can be held at the same time and often over the same object. The slide between each right (liberties, use-rights, and property rights) is gradual rather than binary, because rights over objects are acquired through contingent human activity. And more, the stages are not necessarily historical. In most periods of history, different agents may hold all three rights at once over the same thing. For example, a renter has certain property rights and use-rights in their rented home, such as strong exclusive claims to access the home, and the landlord has property rights to leverage the property for profit. The renter holds use-rights in the home that may not expressed well as property rights. If their rental home is the only option for safe housing, they may have a use-right to continue to use the home even when the rental contract expires. Similarly, a land owner who owns land with a river running through it has the right to develop and to sell that land. Yet the river banks can be subject to open access. The property right can be held over the river banks, while others hold a liberty right to access the river along the river bank, and in fact this is often how property rights in land abutting a river are construed in conventional law.

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[15] Anna Stilz, *Territorial Sovereignty: A Philosophical Exploration*, Oxford Political Theory (Oxford, New York: Oxford University Press, 2019), chaps. 2–3.

[16] I owe Kim Angell thanks for this example.

But what does it mean to *use* a resource? On my view, a person uses an object when they incorporate it into how they pursue and/or maintain their interests.

There are at least three possible definitions of *use*. The first two are articulated by Eric Roark. The first option is that use entails physical impingement. An agent uses a resource if and only if they physically affect the resource.[17] However, this definition fails to account for several ways that we can be said to use things that are essential for our interests. Sometimes a resource is used even when it is not affected by that use. For example, we use the sun's solar energy without affecting the sun. Likewise, we essentially rely on our use of Antarctic ice sheet the same way we rely on the sun's solar energy. We rely on the Antarctic ice sheet to regulate the temperature of the oceans. This temperature regulation is necessary for the maintenance of marine ecosystems, ocean levels, and global weather patterns. But this passive, indirect use of the Antarctic ice sheet does not affect the ice sheet. This use is nevertheless incredibly important to the securing our basic needs, and if agents were to melt the ice sheet, we would want to be able to say that they are significantly harming us, because we could no longer use the ice sheet in ways we had before. Similarly, this definition cannot account for indirect use. Delivery mechanisms are indirectly used to receive goods. Even though I never travel down a river by boat, goods that I use have been imported by these means. In this way, I indirectly use river navigational routes, although I do not physically affect this navigational route myself. If somebody were to prevent our continued use of these things, by blocking out the sun, melting the ice sheet, or damming the river, the established means for pursuing our interests would be seriously weakened.

The second option for defining 'use' is that an agent uses a resource if and only if they (consciously) make it part of their plans or projects. This definition also fails to capture important ways that we use goods. Sometimes we use things without knowing that we are using them or even that the thing exists. By definition, they are not part of our plans or projects, because we do not conceptualize them as such. Again, solar energy and the Antarctic ice sheet are examples. And also things that we take for granted, like clean water, a safe environment, and physical abilities are usually used as background supports for our plans and projects are not conceived of as parts of those plans themselves.

The third option, which I prefer, says that A uses a resource when A has incorporated the resource into the manner in which A pursues and maintains A's interests. This definition focuses on the physical act of incorporation. Physical incorporation can be direct, indirect, passive, and un-known. As long as the resource plays a part in how an agent advances or maintains her interests, then it is being used by her. This applies to our use of solar energy and to potable river water. While drinking water is directly incorporated (literally) into an agent's overall means to pursue and maintain her interests, solar energy is often indirectly incorporated into these overall means. This conception of use stretches to include our indirect use of things like the Antarctic ice sheet. The ice sheet is physically central to the background environmental conditions of climatic stability that one incorporates into her ability to pursue their interests. Most humans effectively, albeit unknowingly and indirectly, rely on the ice sheet as a means to pursue their goals. Similar things can be said of any natural resource that is incorporated into the actual means utilized by agents to maintain and pursue their interests.

What about resources that a person wants to use to promote her interests, but has not yet done so? Or resources that are leveraged, but not actually incorporated into use? Can a person claim a use-right in these resources? The answer is 'no'. Even on my broad conception of 'use', the object must be physically incorporated into the promotion of one's interests in order to count as being used. If an object is not physically part of the causal chain, then it is not used. While this includes passive and

[17] Eric Roark, "Applying Locke's Proviso to Unappropriated Natural Resources," *Political Studies* 60, no. 3 (October 1, 2012): 689, https://doi.org/10.1111/j.1467-9248.2011.00935.x. Anna Stilz employs the second meaning of 'use' for her adaptation of use rights. Stilz, *Territorial Sovereignty*, chap. 3.

indirect physical interaction, such as using the Antarctic ice sheet, it does not include intentions or desires or wholly un-used resources that one just happens to be near, such as undiscovered underground oil. This coincides with the limited reach of use-rights. To establish a wider set of rights over a wider base of resources, one must acquire property or territorial rights in those resources.

Because use and thereby use-rights extend over a broad set of global resources, such as resources that support the absorptive capacity of the atmosphere, the polar ice sheets, carbon sinks and ocean systems, the process of dividing rights over goods might seem daunting. Despite this broad net, I maintain that this conception of 'use' is beneficial because it helps us to articulate ways that we utilize resources systems and crucial environmental features, like the sun or the polar ice caps. With this conception of 'use', we have the means to articulate humanity's claims as use-rights.

This conception of use applied to a theory of use-rights results in an expansive set of rights over objects that we use.[18] Individuals can acquire use-rights over objects in the commons when they physically incorporate that object into the manner in which they pursue their interests, as long as the acquisition does not violate provisos.

Fortunately, because Pufendorf's theory of use-rights laid the foundation for overlapping sets of rights to the same object, then the acknowledgement of extensive use-rights to expansive resources is not infeasible. Territorial and property rights can be held over the same goods to which others hold use-rights. The use-right implies that the property or territorial right holder cannot violate the use-right by preventing the use-right holder's continued use of that item.

Even with this adaptable theory of use-rights, sometimes use-rights and property rights will conflict. When this happens, we need to know how to resolve the conflict. For example, when property rights leave people without access to the objects of their basic needs, then those property rights must be modified or nullified to correct the problem. Generally, these constraints on claim rights are called *provisos*, a condition that limits or constrains the acquisition or holding of property rights.

APPLYING THE CRITERIA TO THE ANTARCTIC

Remember that a resource domain is a global commons where it meets both of these criteria:

1. All nations have legal access to the domain, and
2. The effects of use/management or abuse/mismanagement of the domain are experienced universally.

In this section I argue that Antarctic ice is a global commons. However, this does not mean that the whole of the Antarctic is a global commons.

First, all nations have legal access to the Antarctic. The Antarctic is situated beyond any existing state territorial jurisdiction. No nation is recognized by international law as possessing sovereign territory within Antarctica. This legally entails universal access to the continent. One does not need a passport to go to Antarctica, and one does not need permission to cross from one region to another. According to the 1998 Environmental Protocol, some visitors to the continent may be legally required to obtain a permit before visiting, but this requirement does not constitute limited access. A permit is only required by those visitors who are citizens of countries who signed the protocol, and permits are easily obtained.

While territorial claims have been advanced by states, those claims have not been recognized. Seven states have independently lodged official claims to territory in Antarctica: Chile, Argentina,

[18] Kim Angell, "Resource Rights: Expanding the Scope of Liberal Theories," *Journal of Social Philosophy* 50, no. 3 (2019): 322–40, https://doi.org/10.1111/josp.12274.

United Kingdom, Norway, Australia, France, and New Zealand. Although these claims were initially put forward through legal procedures, the process of adjudicating the claims was halted by the Antarctic Treaty in 1959. The Antarctic Treaty freezes the territorial claims and does not renunciate or lessen them.[19] This means that the initial claims are still legally 'in the works', albeit stalled indefinitely. Still, even if the claims were to be pursued today, it is doubtful that they would be internationally recognized. One reason for this is the rise in power of non-claimants in the Antarctic, like the US, Russia and China. It is unlikely that these countries would recognize territorial claims of other states that could jeopardize their continued interests on the continent. Especially with the prospect of mineral exploitation becoming a legal possibility in 2048, states and commercial entities are already positioning themselves to take advantage of what they hope will be a great resource extraction opportunity. Non-claimant parties who believe they have a real opportunity to exploit natural resources in the Antarctic would resist any attempt for a state to exclusively claim part of the continent as their own.[20] In addition, even if it were legally feasible for these claims to become recognized, there are moral reasons to doubt their validity. Alejandra Mancilla argues that, for any recognized theory of territorial rights, claimant states have only very tenuous moral claims to territory on the continent.[21]

One might object that the Antarctic cannot be a global commons, because it is governed by decisions made by a set of nations. The Antarctic Treaty System (ATS) has managed the continent for over sixty years and has done so with considerable success. The ATS cannot be simply ignored or overturned by the international community. Buck points out how this could mean that the Antarctic is an 'international commons'—shared by several nations, and not a global commons. However, two features of the ATS entail its global nature: it has an open membership—any state can apply to become members if they meet the membership conditions— and the ATS is not governed by regional logic, such as other regional international commons like the Mediterranean Sea. Instead, governance of the Antarctic has a genuine global logic. Thus, the Antarctic meets the first criterion; all nations have legal access to the domain.[22]

Second, a large part of the Antarctic meets the second criterion of universal effect: its ice. The Antarctic is made up of many resources and resource domains. Since the criterion of universal effect is not targeted at a particular resource domain or resource, it is tricky to apply it to an entire continent. Some authors argue as if the criterion of universal effect is the same thing as the criterion for a resource to be a common pool resource, but I think this is an unhelpful equivocation. A *common pool resource* is a resource that is easily accessed and rivalrous. In other words, it is difficult to monitor or to restrict people from accessing the resource, and when it is used, the value of the resource for others is diminished. Examples, such as marine fish stocks, are valuable, non-renewable resource systems located in an area where it is difficult to monitor access to the resource. Many Antarctic resources are common pool resources, such as marine animals, birds, and ice shelves (if the ice were harvested or destroyed in vast quantities.) Regulation of fishing and hunting is necessary to prevent a depletion of these resources. Nevertheless, applying the common pool resource understanding to the very large and diverse set of resources in the Antarctic is misguided, because some resource domains and resource systems in the

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[19] ATS parties, "The Antarctic Treaty" (Secretariat of the Antarctic Treaty, 1959), pt. Article IV, https://www.ats.aq/e/ats_keydocs.htm.

[20] Doaa Abdel-Motaal, *Antarctica: The Battle for the Seventh Continent* (Santa Barbara, CA: Praeger, 2016), 54–59, http://www.abc-clio.com/Praeger/product.aspx?pc=A5142C; Joyner, *Governing the Commons: The Antarctic Regime and Environmental Protection*, 56–58; Alan D. Hemmings, Klaus Dodds, and Peder Roberts, "Introduction: The Politics of Antarctica," in *Handbook on the Politics of Antarctica* (Massachusetts: Edward Elgar Publishing, n.d.), 1–20.

[21] Alejandra Mancilla, "The Moral Limits of Territorial Claims in Antarctica," *Ethics & International Affairs* 32, no. 3 (ed 2018): 339–60, https://doi.org/10.1017/S0892679418000527.

[22] Buck, *The Global Commons*, 6.

Antarctic are not common pool resources. The buried Lake Vostok, for example, possibly contains a treasure of unique biota. It is not clear if the lake is a renewable resource, or if by accessing the under-ice ecosystem, we would destroy its unique value. Even if it is a rivalrous resource system, the difficulty in accessing the Lake means that it is not a common pool resource. Because the lake is hidden under half a mile of ice, accessing it is difficult, takes time and would be possible to monitor. Many other small-scale resources in the Antarctic would not be common pool resources, such as individual camps, stations, or other sites of enclosed spaces created for human use. This means that other systems of management, apart from systems designed for accessible common pool resources, would be appropriate for Antarctic resources where access can be restricted.[23]

While some Antarctic domains and systems are common pool resources, Antarctica as a whole is not a common pool resource. Further, the conditions of a common pool resource do not imply universal effect. A public non-toll road is a common pool resource, but the effects of the management of a road will not be experienced universally. Similarly, a natural boat landing area on the continent may be a common pool resource, but the effects of its management will not be experienced universally. Knowing that a resource domain in Antarctica is or is not a common pool resource may tell us something about how that resource domain should be managed locally, but it does not necessarily imply anything for how or if it should be managed globally.

An alternative way of interpreting the empirical criteria of the global commons is to look for resources in the Antarctic that meet the criterion of universal effect. This benchmark does not demand that the resource domain has the features of a common pool resource, but rather that the effects of the domain's use are experienced, in some central way, by all of humanity. There is one part of Antarctica that clearly matches this condition. Its features are unique to the region, globally important for people's vital interests, and describes most of Antarctica's landscape: ice.

Antarctica constitutes ten percent of the Earth's land area and contains more than ninety percent of its ice. Because frozen water sheds its salt content, all of the ice in the Antarctic is freshwater. Scientists estimate that around seventy to eighty percent of the world's freshwater sits in Antarctic ice.[24]

The 'large' ice in Antarctica comes in three geographical types. The *ice sheet* refers to the ice mass that covers the continent's land mass. Covering ninety-eight percent of the land, this ice sheet rises to an average thickness of 2000 meters and some places have measured depths of 4500 meters. *Ice shelves* are floating masses of ice that are fused with the ice sheet by glacial ice. This happens because the protrusions of ice and floating icebergs fuse together after being trapped by islands or in bays. More than one-tenth of the total ice that we see covering Antarctica is actually floating ice shelves. Near the shore, ice shelves can be several hundred meters thick, and they thin as they extend out to sea. When ice shelves break off, the free floating masses are *icebergs*. Icebergs come in all shapes and sizes. In 2017, the Larsen C ice shelf calved the 2,200 square-mile, trillion-ton iceberg A68.

While much of the ice sheet can be considered *terra firma*—solid land—the white Antarctic landscape is dynamic. Gravity pulls on ice shelves and moves them downward, and ice shelves progress seaward at a rate of approximately one meter per day.[25] Despite the fact that Antarctica has most of the

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[23] The distinction between public goods and common pool resources is also highly relevant in Antarctica. See Bernard P. Herber, *Protecting the Antarctic Commons: Problems of Economic Efficiency*, Udall Center Fellows Monographs (Tucson, AZ: Udall Center for Studies in Public Policy, University of Arizona, 2007).

[24] Herber, 7; Norwegian Polar Institute, "Did You Know That Antarctica Has More Freshwater than Any Other Place on Earth? | South Pole 1911-2011," accessed March 9, 2019, https://nettarkiv.npolar.no/sorpolen2011.npolar.no/en/did-you-know/2011-10-22-antarctic-has-more-freshwater-than-any-other-place-on-earth.html.

[25] Joyner, *Governing the Commons: The Antarctic Regime and Environmental Protection*, 6; NASA LIMA, "Meet Antarctic," accessed March 9, 2019, https://lima.nasa.gov/antarctica/.

world's freshwater, it is also one of the driest places on the planet. It is classed as 'hyper arid' along with places like the Sahara Desert. Precipitation on the continent averages less than 55 mm per year.[26] This means that ice is built up in Antarctica in geological time, over thousands of years. In Antarctica, then, ice is considered to be a non-renewable resource, like oil. Loss of ice is not replenished in human time.

The ice in Antarctica is of key global importance for three reasons. First, freshwater is scarce in certain densely populated areas. And freshwater is a basic human need—we can't survive without it. If the freshwater in the Antarctic ice could be harvested and distributed appropriately, it may be able to alleviate some of the most desperate needs. Second, the massive ice forms in the Antarctic regulate global oceanic temperatures and environmental systems. The Antarctic ice regulates the temperature of the Southern Ocean.[27] Cold water maintains the Antarctic convergence, an important climatic boundary between air and water masses surrounding the Antarctic continent. Because of the ice, the water in the Southern Ocean surrounding the continent is cold. The ice also creates high-salinity areas, because when sea water turns into ice, it sheds its salt content. This makes the Southern Ocean both colder and denser than the oceans it borders. The cold ocean water creates a heat sink for the globe, soaking up heat from the atmosphere. The Southern Ocean has unique global importance, because it is the only ocean that circles the globe. This simple fact has profound implications for the global ocean circulation and the Earth's climate system.

> The circumpolar channel of the Southern Ocean allows a vast ocean current, the Antarctic Circumpolar Current (ACC), to circle from west to east around Antarctica. Because the ocean basins are almost surrounded by land except at their southern boundaries, the ACC is the primary means by which water, heat, and other properties are exchanged between the ocean basins. For example, the ACC carries about 145 million cubic metres of water per second from the Indian to the Pacific basins south of Australia, a flow equivalent to about 150 times the flow of all the world's rivers combined. The ACC connects the Atlantic, Pacific and Indian Oceans to form a global network of ocean currents that redistributes heat around the Earth and so influences climate.[28]

Antarctic ice maintains the unique environmental systems of the Southern Ocean, and thereby the global oceans, by contributing to the cold and high salinity levels of the ocean.

Third, if the ice melted entirely, global sea levels would rise an estimated sixty meters. The land mass of Antarctica, released from the weight of the ice, would rise approximately 200-300 meters, displacing even more water.[29] Rising sea levels swallow up great amounts of land, triggering massive migration. And also rising sea levels are associated with more dangerous hurricanes and typhoons and the devastation of coastal habitats due to erosion, flooding, and soil and aquifer contamination. There is evidence that 'rapid' melting (in geological terms, this melt will take over 200 years) of the glaciers in Antarctica is underway, and that this could de-stabilize the ice sheets.[30]

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[26] British Antarctic Survey, "Antarctica's Climate: The Key Factors," *Discovering Antarctica* (blog), accessed March 9, 2019, https://discoveringantarctica.org.uk/oceans-atmosphere-landscape/atmosphere-weather-and-climate/key-factors-behind-antarcticas-climate/.

[27] Herber, *Protecting the Antarctic Commons: Problems of Economic Efficiency*, 26.

[28] Australian Antarctic Division, "The Southern Ocean's Global Reach," accessed August 21, 2019, http://www.antarctica.gov.au/magazine/2001-2005/issue-4-spring-2002/feature2/the-southern-oceans-global-reach.

[29] Joyner, *Governing the Commons: The Antarctic Regime and Environmental Protection*, 7.

[30] Ian Joughin, Benjamin E. Smith, and Brooke Medley, "Marine Ice Sheet Collapse Potentially Under Way for the Thwaites Glacier Basin, West Antarctica," *Science* 344, no. 6185 (n.d.): 735–38.

In sum, Antarctic ice plays a crucial and unique role in the natural systems of planet Earth. Antarctic ice serves a unique and central function for humanity for three reasons: fresh water, oceanic temperature regulation, and water retention. Loss of critical amounts of the ice would devastate global environmental systems, resulting in modified animal migration and weather patterns and a dramatic rise in ocean levels. The effects on human life worldwide could be catastrophic.

GLOBAL COMMONS, PROTECTED USE-RIGHTS

From the previous section, we can conclude that most of Antarctica, the Antarctic ice, is a global commons. Because ice covers almost all of the continent, almost all attempts to access resources other than ice in Antarctica will have to deal with the ice first. On most of the continent, ice, not land, is terra firma. Consequently, any effort to advance a legitimate territorial claim to Antarctica will have to face the moral obstacle arising from the fact that Antarctic ice is an important resource for all of humanity. But what kind of obstacle is this? I argue that global commons domains are subject to claims of *common ownership*. Specifically, this common ownership regime should be understood as a use-right held by all persons that places constraints on property and territorial rights.

International legal scholars argue that the global commons criteria suggest that areas of the global commons should be managed under principles of Common Ownership. Those philosophical arguments aimed to establish that all natural resources should fall under the domain of Common Ownership, regardless of their particular effects on humanity.[31] In contrast, the core consideration for saying that Antarctic ice should be managed as commonly owned is that the this resource affects the interests of humanity.[32] Because all persons are affected by the management of the ice, then all persons have some set of claims to it, or so the argument goes. I think that there is something to this line of thinking. Starting from the negative commons, we can interpret humanity's collective ownership as a Pufendorfian move into positive commons. That is, once humans have interacted with it, they may be able to claim sets of rights over it. Arguments supporting the global commons pick out special resources that each human has a claim to because of their actual use of those resources, not because of their a priori status as humans. To defend this use-based account of the global commons, we need a better understand of the claims that are generated by humanity's use of Antarctic ice.

One possible way to interpret humanity's claim is provided by the Common Heritage of Mankind framework. According to this framework, areas beyond current state jurisdictions are owned collectively by all the world's citizens and cannot be claimed under state territorial rights. The common heritage of mankind is based on two realizations: (1) that some valuable natural resource stocks are close to depletion, and (2) that a first-come-first-served rule to the world's untapped resources would disadvantage many developing nations. This principle protects the interests of developing nations by jointly managing depleted or vulnerable resources, such as fish stocks or rare minerals, in areas beyond state jurisdiction. It also asserts the rights of developing nations to participate in the management of and benefit sharing from the extraction of minerals from areas like the sea bed.[33]

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[31] Megan Blomfield, *Global Justice, Natural Resources, and Climate Change* (Oxford: Oxford University Press, 2019); Mathias Risse, "Taking up Space on Earth: Theorizing Territorial Rights, the Justification of States and Immigration from a Global Standpoint," *Global Constitutionalism* 4, no. 1 (2015): 81–113.

[32] Rudiger Wolfrum, "Common Interest and Common Heritage in Antarctica," in *Handbook on the Politics of Antarctica*, ed. Klaus Dodds, Alan D. Hemmings, and Peder Roberts (Cheltenham, UK: Edward Elgar Publishing, 2017), 145.

[33] Buck, *The Global Commons*, 28–29; Wolfrum, "Common Interest and Common Heritage in Antarctica," 142–43; Abdel-Motaal, *Antarctica: The Battle for the Seventh Continent*, 152; Herber, *Protecting the Antarctic Commons: Problems of Economic Efficiency*, 28–19; John Vogler, "Global Commons Revisited," *Global Policy* 3, no. 1 (2012): 61–71, https://doi.org/10.1111/j.1758-5899.2011.00156.x.

Using the common heritage principle to interpret humanity's right to Antarctic ice faces several obstacles. First, the desiderata for the Antarctic global commons—conserving Antarctic ice—is not part of the common heritage framework. With ice preservation, the central problem to address is how individual actors are motivated to destroy the resources in the commons to gain self-benefit.[34] Although the individual actors under a common heritage regime are regulated by an international body, they remain motivated from, and allowed to pursue, self-benefit. Arguments on behalf of common heritage stress the "immediate political and economic returns" of exploiting resources, and they do not prioritize "the necessity to conserve resources and protect the environment of a global commons area."[35]

Second, the common heritage principle is not suited for areas that can be inhabited. Doa Abdel-Motaal notes that occupation is gradually making Antarctica less of a 'commons'. People have been born, married, and died there. And many have lived significant portions of their lives on the continent, as seasonal scientists or other operators, and even as permanent settlers. She notes the extent and spread of scientific research stations, some of which operate year round, and two civilian settlements on the Antarctic peninsula. The Chilean village of Villa Las Estrellas, located on an Antarctic island north of the peninsula, has a school, post office, and health care facility serving its small population of about 100. The Argentinian Esperanza base is home to a slightly smaller settlement on the peninsula.[36] The common heritage principle is inappropriate for occupied areas, because individuals and groups need to have some set of self-determination rights over their space and located resources, to serve their needs and to form effective political units. Individuals and collectives living in an area acquire natural use and property rights to resources there that are incompatible with strong rights of collective ownership.

From the crucial role Antarctic ice plays in the lives of most humans, we can conclude that the appropriate management regime for Antarctica should prioritize ice conservation. And also, because people spend valuable parts of their lives with others, creating lasting and meaningful residential places and social spheres in the Antarctic, its management regime should also be consistent with small sets of exclusive claims to homes, bases, and other kinds of individual property rights and claims to collective self-determination that have been legitimately established there. Because of this last point, the management regime should be consistent with local and regional governance structures with (limited) territorial jurisdictional domains. Because a common heritage framework does not prioritize conservation and prohibits private property and territorial claims, it does not seem to a good fit for the Antarctic.

Instead, I argue that a normative framework for the Antarctic regime can be constructed by interpreting common ownership of Antarctic ice as a global use right that places constraints on property and territorial rights. The concept of *use* should be understood as incorporating a resource into the manner in which an agent pursues or maintains their interests. This definition focuses on the physical act of incorporation, and physical incorporation can be indirect, passive, and un-known. As long as the resource plays a part in how an agent advances or maintains her interests, then it is being used by her. This applies to Antarctic ice. Humanity's use of the Antarctic ice is not direct. It is instead indirectly or passively incorporated into the overall means we utilize to pursue and maintain our interests.

The Antarctic is important because it, among other things: (1) houses fresh water, (2) regulates ocean temperatures, and (3) while frozen, the water in the ice sheets does not raise the ocean water level. These aspects are of global importance, but only the second and third items count as ways that humanity currently uses resources in the Antarctic. All persons on Earth use the Antarctic ice as a temperature regulator and as a 'frozen reservoir' of water kept from the ocean. In contrast, that fresh water is found

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[34] Garrett Hardin, "The Tragedy of the Commons," *Science* 162, no. 3859 (December 13, 1968): 1243–48, https://doi.org/10.1126/science.162.3859.1243; Vogler, "Global Commons Revisited," 61.
[35] Joyner, *Governing the Commons: The Antarctic Regime and Environmental Protection*, 34.
[36] Abdel-Motaal, *Antarctica: The Battle for the Seventh Continent*, 153–55.

in the Antarctic is only a potential use. Even on my broad conception of 'use', the object must be physically incorporated into the promotion of one's interests in order to count as being used. If an object is not physically part of the causal chain, then it is not used. People, that is, people not in Antarctica, do not use this ice for fresh water needs, such as for drinking or irrigation.

Because all persons need to use natural resources to provide for our basic needs and to engage in social transactions, use-rights are rights that all persons can acquire under the laws of nature. A person has a claim to continue using a resource that they currently use and a corresponding obligation that no other person physically interferes with the right-holder's use of the item.[37] When an object is not incorporated into one's use, then this perfect right does not hold.[38] However, a use-right does not include the right to dispose of the thing as one pleases. This means that a use-right does not include the right to 'alienate' a resource by selling, trading, or leasing it. Nor does a use-right include the right to exclude others from the resource, except under certain conditions. The use-rights that persons may claim to Antarctic ice are thin. They include a defeasible claim to continue to use the ice as they are doing now. But this right does not include claims to manage the ice or to exclude others from the using it.

Because use is a broad category, we end up using, and thereby having use-rights to, a broad range of resources that are not in our possession. We have use-rights to the Antarctic in as much as we use its resources. Assuming that these are perfect use-rights, then they correlate to obligations that others have not to interfere with our continued use of the ice for these purposes. But what are these obligations, exactly?

First, our use-rights to the Antarctic ice do not entail that others cannot acquire property or territorial rights to Antarctic ice. But rather, any rights acquired in Antarctic ice are constrained by our use-rights. The acquisition is constrained by concerns for compensation. Because the user has a claim-right to the items they are using, others do not have a liberty to create property and territory in these resources *unless* they secure the user's permission or compensate the user. Pufendorf argues that there is a perfect obligation not to take something that someone has made valuable. On his view, if you receive something of value from another person, you can't presume that the person is giving you a gift.[39] You must instead presume that when you receive something of benefit, that you owe something in return, unless the giver expressly conveys their intention to relieve you of this duty. In the context of use-rights, the presumption against gift giving tells us that a person's possession and/or use of a resource creates perfect rights over it.[40] Similar to the Lockean 'enough and as good' proviso, this condition prohibits the acquisition of property in objects that are currently being used, unless the would-be property-holder compensates the user with 'enough and as good' as the user had already incorporated into their use.

Compensation requires that a person is given something in return for what they have lost. In the case of use-rights, compensation occurs when the injured party is provided with a 'full and perfect equivalent' for the thing that they can no longer use.[41] What counts as compensation will depend on the way that the item has been incorporated into the pursuit of the agent's interests.

Unfortunately, Antarctic ice plays a unique role in our global ecosystems that cannot be substituted. *Nothing can do the job that this ice does*. Because of these physical constraints, compensation is impossible.

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[37] Pufendorf, *DJN*, 4.4.5.1; 4.4.10 (pp. 292, 298).
[38] Pufendorf, *DJN*, 290, 298 (4.4.2 and 10). With an exception made for the right of necessity. See below.
[39] Pufendorf, 382, 384 (5.3.1,7).
[40] Pufendorf, *DJN*, 292, 309 (4.4.4; 4.5.9).
[41] Robert E. Goodin, "Theories of Compensation," *Oxford J. Legal Stud* 9, no. 1 (1989): 59. Quoting Monongahela Navigation Co v US, No. 148 (US Supreme Court 1893).

Note that, in most cases, climate change adaptation measures would not constitute perfect substitutes for loss of Antarctic ice. For example, even without massive Antarctic ice-sheet loss, potential climate change sea level rise in 2050 is 50 centimetres. For Bangladesh, this means a loss of up to 20 percent of its land mass. Climate adaptation in cases such as these will require the relocation of families, changes in economic activities, and inevitable disruption to individuals' projects and goals for their lives. Millions of people will become climate refugees, only able to find a place where they can meet their basic needs in other countries, and some state territories will be entirely lost.[42] Adaptation measures that force people to relocate, cannot constitute perfect compensation, because relocation disrupts he basic functioning and roles of residents. Similarly, forcing individuals to change economic activities, social clubs activities, or political affiliations effectively forces them to alter their ends.

However, despite the fact that our use-rights to Antarctic ice cannot be compensated, acquiring parts of the Antarctic as property or territory may still be legitimate. Use-rights create a constraint on property and territorial rights, but they do not prevent property and territorial rights from co-existing over the same objects. I can have use-rights to the water in a stream that runs through your property. In the same way, humanity can have use-rights to ice that is located within an individual's property or a group's territory. Property and territorial rights can be legitimately acquired over Antarctic ice, with the constraint that these rights include a duty to conserve the ice. Because we use the Antarctic ice indirectly, our continued use of the ice only requires that the ice continue to exist and continue to function as a temperature regulator for global ecosystems. If property and territorial rights include a duty to preserve the ice, they can be consistent with global use-rights to the ice.

To block the acquisition of any property or territorial right in the Antarctic, one would need to show that property or territorial title prohibits the global use of Antarctic ice. They would need to show that in order to protect global interests in Antarctic ice, people worldwide would need to directly rule over the activities and property regimes of the Antarctic. But, in fact, local Antarctic activities of property or territorial owners are not a clear threat to the conservation of Antarctic ice, especially when carried out with appropriate concern for ice preservation. Instead, the greatest threat comes from global warming. Global warming, the gradual rise of the Earth's average temperature, is facilitated by the greenhouse effect—warming that results when the atmosphere traps heat radiating from Earth. Certain gases in the atmosphere, including water vapour, carbon dioxide, methane, and nitrous oxide, block heat from escaping. The gradual rise of the Earth's temperature is linked to the depletion of glaciers and ice sheets in the Antarctic. Since the Industrial Revolution, human activity has increased the level of greenhouse gases in the atmosphere. Activities like large-scale coal burning and other fossil fuels are the greatest contributors, and these large-scale contributions happen elsewhere, not in Antarctica. Protecting global use-rights to Antarctic ice speaks first to the regulation of greenhouse gas emissions from inhabited territories. The regulation of rights and activities on the continent itself is only a secondary consideration, at least while human activity on the continent is minimal.

To be sure, international courts will be required to adjudicate claims of rights violations. But this does not prohibit territorial or property rights from being acquired. It is also necessary to adjudicate claims to compensation for climate change disasters caused by the ice melt, such as rising sea levels that cause large scale population relocation. While these claims will involve a causal assessment of the damage to the ice by various actors, it is most likely that these actors are not located in the Antarctic. Adjudication and resolution of these claims to compensation will only peripherally involve located property and territorial rights in the Antarctic.

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[42] Cara Nine, "Ecological Refugees, States Borders, and the Lockean Proviso," *Journal of Applied Philosophy* 27, no. 4 (November 1, 2010): 359–75, https://doi.org/10.1111/j.1468-5930.2010.00498.x; Blomfield, *Global Justice, Natural Resources, and Climate Change*, 166.

In sum, that a substantial portion of the Antarctic continent is a global commons does not prevent parts of the continent from being acquired as territory or property. Antarctica does not need to remain beyond jurisdictional control to protect humanity's interests in Antarctic ice. Local territorial units can be legitimately established there, as long as the exercise of their powers coordinate the effective management of ice conservation.

Conclusion

This essay developed an account of the common ownership regime for areas of critical importance to humanity from a Pufendorfian conception of use-rights.

The Antarctic ice is a global commons, because it lies beyond national jurisdictions, and it serves a unique and central function for humanity in its role in oceanic temperature regulation and water retention. I have argued that all persons have natural use-rights to the Antarctic ice that require its conservation. Use-rights to the Antarctic ice does not prohibit the legitimate acquisition of exclusive rights in the Antarctic, as long as they continue to conserve the ice. That is, a group could remove a portion of the ice from the global commons by legitimately acquiring territorial rights over the area that contains the ice. Use-rights create a constraint on property and territorial rights, but they do not prevent property and territorial rights from co-existing over the same objects. Antarctica does not need to remain beyond jurisdictional control to protect humanity's interests in Antarctic ice. Local territorial units can be legitimately established there, as long as the exercise of their powers coordinate the effective management of ice conservation.

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