a party – provided that the state *in whose airspace* an aircraft registered with another state is flying is the primary state entitled to exercise its "criminal jurisdiction over an offence committed on board" that aircraft – although the former state should not do so unless other criteria apply.[103]

What is missing, then, is firstly, some actual temporary enforcement competence. Like the captain of an aircraft, the 'captain' of a suborbital spaceship should perhaps be endowed with the right to exercise temporary police powers during flight in order to be able to take appropriate measures of physical restraint – as necessary and, of course, feasible – until formal enforcement can take over after landing (back on earth).[104] Interestingly, the aforementioned Tokyo Convention in establishing such powers for an aircraft commander *does* seem to apply to "any act regardless whether it is an 'offence' that may or actually does jeopardize safety or good order and discipline on board. It would thus apply, e.g., to unruly conduct such as smoking on board when it is prohibited, use of electronic equipment when prohibited, rude behaviour" and suchlike.[105]

Similar enforcement questions would have to be answered with respect to resource exploitation activities on celestial bodies, once allowed under a licensing system as per Title IV of the U.S. Commercial Space Launch Competitiveness Act.

Secondly, the application of federal law in civil and commercial matters over US-registered space objects and/or celestial bodies resource exploitation facilities should be principally established. Of course Congress might wish to effectively limit its application to

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[103] Namely, if "(a) the offence has effect on the territory of such State [being overflown]; (b) the offence has been committed by or against a national or permanent resident of such State; (c) the offence is against the security of such State; (d) the offence consists of a breach of any rules or regulations relating to the flight or manoeuvre of aircraft in force in such State; [or] (e) the exercise of jurisdiction is necessary to ensure the observance of any obligation of such State under a multilateral international agreement." Convention on Offences and Certain Other Acts Committed on Board Aircraft, Art. 4, in conjunction with Art. 1(2), , Tokyo, 14 September 1963, 704 U.N.T.S. 219 [hereinafter Tokyo Convention]. *See* R. Abeyratne, *Space Tourism – Parallel Synergies Between Air and Space Law?*, 53 *ZLW* 190-3 (2004) and M. Chatzipanagiotis, The legal status of space tourists in the framework of commercial suborbital flights 43-4 (2011).

[104] *See* Tokyo Convention, *supra* note 99, Art. 6-9. *Cf.* Perlman, *supra* note 13, 954 (linking this to the US obligation under Art. VI of the Outer Space Treaty to authorize and continuously supervise its "national activities in outer space."

[105] M. MILDE, INTERNATIONAL AIR LAW AND ICAO 225 (2012) (emphasis added).

particular statutes or particular parts of a statute, and then determine which particular parts of, for example, family law, commercial law or contract law, would actually extend to such registered objects, and how. Carve-outs would probably be needed for example to the extent that the use of radio-frequencies would be involved, as per FCC competencies, respectively as far as concerning remote sensing activities as per NOAA competencies. All that, however, should not stand in the way of establishing such fundamental 'in-space' jurisdiction in and of itself.

As there is no inherent reason at the international level obstructing such exercise of US jurisdiction, the solution is essentially one that could and should be found by the United States itself. The main theoretical-legal problem the United States in that context would have to address, at least with respect to the sub-sector of private human spaceflight, concerns the delimitation of airspace and outer space – which it has so far been unwilling to tackle head-on – as (only) in outer space such jurisdiction over registered spacecraft would not be faced with any substantive legal obstacle, but in airspace the ruling 'territorial' sovereignty might well put such obstacles in front of such exercise.

Obviously, however, from the perspective of public international law this is mainly a problem of international dimensions, namely once the airspace of other countries than the United States would be at issue. As long as such flights would only cross US airspace and the parts of outer space above it, establishing 'in-space' jurisdiction would just require aligning the FAA's AST authorities with the FAA's competences in regulating the National Air Space.[106]

This would for the time being not require any definitive decision on (1) where, vertically speaking, the boundary-line between the US National Air Space and outer space would lie, or even whether such a boundary should be determined at all; (2) whether 'on-orbit' jurisdiction as the applicable label should not consequently be formally replaced also in US documents with 'in-space' jurisdiction, requiring a solution at least in theory regarding the

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[106] *See* 49 U.S.C. Subtitle VII, esp. Part A.

extent to which the lower boundary of outer space would be equivalent to the lowest possible orbit[107]; and/or (3) whether a workable definition of 'space object' for the purposes of arranging for US liabilities under international space law can exist without reference to a well-defined area of 'outer space' into which such objects are intended to be launched.

Following Perlman in his extensive analysis, there is on the one hand ample reason to expect a growing need for such regulation of more normal commercial and (un)civil behaviour on board of US-registered vehicles, potentially being used for longer and longer flights, and on the other hand there do not exist principled obstacles even within the US context itself to the exercise of such US jurisdiction on a more profound and coherent basis than hitherto.[108]

In between the extensive discussion at the 7th Annual University of Nebraska-Lincoln's Washington Conference on Space Law on 3 November 2014 of the White Paper with key stakeholders from the various government agencies and the industry and the drafting of the present contribution, a Staff Working Draft dated 11 March 2015[109] had proposed to include a Section 7, entitled "Space authority," in the then-Bill on space resource mining being discussed, notably stating the following:

> (a) IN GENERAL.—Not later than 120 days after the date of enactment of this Act, the *Secretary of Transportation*, in consultation with the Secretary of State, the Administrator of the National Aeronautics and Space Administration, and the heads of other relevant Federal agencies shall—
>
> (…)
>
> (2) *identify any gaps in oversight authority* for the activities described in paragraph (1);

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[107] See for the discussions on this issue see M. BENKÖ & E. PLESCHER, SPACE LAW – RECONSIDERING THE DEFINITION/DELIMITATION QUESTION AND THE PASSAGE OF SPACECRAFT THROUGH FOREIGN AIRSPACE 3*ff* (2013).

[108] See Perlman, *supra* note 13, 937-66.

[109] Staff Working Draft, Mar. 11 2015 (on file with author).

> (3) *recommend an oversight regime* that would prioritize safety, promote the U.S. commercial space sector, and meet the United States' obligations under international treaties (…).[110]

The initiative would thus have lied with the Secretary of Transportation, under whose *aegis* the FAA AST operates, whereas other relevant Federal agencies and NASA shall be consulted – presumably to ensure no extension of FAA AST jurisdiction for the purpose would unduly encroach upon their respective authorities.

Unfortunately, this proposed clause did not make it into the Act as it was enunciated November 2015; in particular, the suggested lead role of the FAA was erased, and no Federal agency specifically named.[111] Thus, there is no guarantee that other outcomes than providing the FAA AST with something close to 'in-space' jurisdiction could not occur, even if from a logical perspective this would be the clearly preferable course but in any event the first step seems to have been made. To paraphrase a well-weathered but never worn-out statement: this may well be a small step for a government, but a giant leap for commercial operators – at least in the United States.

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[110] *Id.* at §7 (emphasis added).

[111] See Sec. 51302(b).

COMMENTARIES

THE LEGALITY OF MINING CELESTIAL BODIES

*Thomas Gangale**

I. THE CONTROVERSY

On 25 November 2015, U.S. President Barack Obama signed into law H.R. 2262, the U.S. Commercial Space Launch Competitiveness Act of 2015. Section 51303 provides:

> A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.[1]

The new law set off a flurry of reportage in the online popular media. The Canadian Broadcasting Corporation reported of Ram Jakhu, a law professor at the Institute for Air and Space Law at McGill University:

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[1] U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90 (2015) [hereinafter CSLCA].

> He said the 1967 Outer Space Treaty, signed by the U.S. and other countries, including Canada, makes it clear that the surfaces and contents of asteroids and other celestial bodies are protected from commercial harvesting.[2]

Gbenga Oduntan, a law professor at the University of Kent, wrote of H.R. 2262:

> It goes against a number of treaties and international customary law which already apply to the entire Universe.
>
> The act represents a full-frontal attack on settled principles of space law which are based on two basic principles: the right of states to scientific exploration of outer space and its celestial bodies and the prevention of unilateral and unbridled commercial exploitation of outer-space resources. These principles are found in agreements including the Outer Space Treaty of 1967 and the Moon Agreement of 1979.
>
> …[T]he Moon Agreement (1979) has in effect forbidden states to conduct commercial mining on planets and asteroids until there is an international regime for such exploitation. While the US has refused to sign up to this, it is binding as customary international law.[3]

Granted, the online popular media is not the best venue for legal argumentation. It can be asserted plausibly, however, that any declaration to the online popular media that the recent act does *not* violate international law would be received as something less than sensational.

The present article traces backward through time a consistent chain of statements contained in the 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement); the 1967 Treaty on Principles Governing the Activities of States in the Exploration of Outer Space, Including the Moon and other Celestial Bodies (Outer Space Treaty); the U.S.

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[2] *U.S. space-mining law seen leading to possible treaty violations*, CBC NEWS, Nov. 26, 2015. http://www.cbc.ca/news/technology/space-mining-us-treaty-1.3339104 (accessed 8 December 2015).

[3] Gbenga Oduntan, *Who owns space? US asteroid-mining act is dangerous and potentially illegal*, *THE CONVERSATION,* Nov. 25, 2015, https://theconversation.com/who-owns-space-us-asteroid-mining-act-is-dangerous-and-potentially-illegal-51073

Senate hearings on the aforesaid treaty; and United Nations General Assembly Resolutions 1962 (XVIII) and 1721 (XVI), together with the *travaux préparatoires* of the aforesaid U.N. treaties and resolutions, to show the following:

- There is no moratorium on the mining of celestial bodies in international law.
- Historically in international space law, the term "national appropriation" has meant an effortless and immoderate taking beyond present necessity, whether by a State directly or through the agency of a nongovernmental entity subject to its jurisdiction, and the prohibition of "national appropriation" does not in any way derogate the natural law principle of creating property through the mixing of labor and soil.
- The Committee on the Peaceful Uses of Outer Space (COPUOS) recognized as early as 1959 that exploration, settlement and exploitation of natural resources raised distinguishable problems, and that only settlement and exploitation raised serious problems of possible claims to sovereignty. As these did not appear likely in the near future, issues pertaining to settlement and exploitation were removed from the COPUOS working agenda until revived in the context of work on the Moon Agreement in 1969. Since these issues were deliberately excluded from consideration between 1959 and 1969, no provision of the aforesaid U.N. resolutions or of the Outer Space Treaty, including the "national appropriation" principle expressed therein, pertains to the settlement or exploitation of celestial bodies.

II. BINDING LAW

To begin, if human law applies "to the entire Universe," one cannot choose but wonder how this presumption of human jurisprudence is viewed by nonhuman sentient beings elsewhere in the universe. More to the point, however, Article 1, paragraph 1 of the Moon Agreement states:

> The provisions of this Agreement relating to the moon shall also apply to other celestial bodies within the solar system,

> other than the earth, except in so far as specific legal norms enter into force with respect to any of these celestial bodies. [4]

It can be seen that the Moon Agreement applies only within our own Solar System, not "to the entire Universe." Second, although "the right of states to scientific exploration of outer space and its celestial bodies" is settled law, "the prevention of unilateral and unbridled commercial exploitation of outer-space resources" certainly is not settled law. Oduntan's assertion notwithstanding, the latter principle is not found either in the Outer Space Treaty or in the Moon Agreement.

Third, the Moon Agreement is not "binding as customary international law." The 1945 Statute of the International Court of Justice, Article 38, paragraph (1) (b) refers to "international custom as evidence of a general practice accepted as law"[5] as one of the sources of international law. Some writers have found this formulation curious, as it is the practice which is evidence of the emergence of a custom. What is clear is that the definition of custom comprises two distinct elements: (1) "general practice" and (2) its acceptance as law. Although a treaty may encompass rules which also have the force of "customary international law," a treaty is not in and of itself evidence of state practice. It may be that Oduntan meant to say that the Moon Agreement is *ius cogens,* "compelling law" that is binding on all, regardless of whether a state is a party to this or that treaty. Ordinarily, the "consent of a State to be bound by a treaty" is required,[6] and

> [e]very treaty in force is binding upon the parties to it and must be performed by them in good faith."[7]

"Positivist voluntarism" is at the very heart of the international legal system, which holds that "international legal rules emanate exclusively from the free will of states as expressed in conventions or by usages generally accepted as law."[8]

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[4] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, *opened for signature* Dec. 18, 1979, 1363 [hereinafter Moon Agreement].

[5] U.N. Charter.

[6] *Id.,* Art. 10 through 15.

[7] *Id.,* Art. 26.

[8] LORI FISLER DAMROSCH ET AL., INTERNATIONAL LAW: CASES AND MATERIALS 58 (4th ed. 2001).

> …[T]here can be no question today, any more than yesterday, of some "international democracy" in which a majority or representative proportion of states is considered to speak in the name of all and thus be entitled to impose its will on other states. Absent voluntarism, international law would no longer be performing its function.[9]

The concept of *ius cogens* is a rare derogation of this principle of positivist voluntarism. It pertains to nearly universal acceptance of certain international norms, such as the prohibition of piracy, human trafficking, genocide, nuclear proliferation, *et cetera.* If the Moon Agreement had something approaching 190 states parties, one could argue convincingly that it had attained the stature of *ius cogens;* in fact, it has only 16 states parties, and none of them have the independent means to access outer space (although there are launch facilities in Kazakhstan, they are owned and operated by Russia). The Moon Agreement is binding only on its 16 states parties, and not on the United States.

Fourth, even were the Moon Agreement binding on the United States, it is untrue that the Agreement "has in effect forbidden states to conduct commercial mining on planets and asteroids until there is an international regime for such exploitation." Endogenously, the assertion is logically inconsistent with the provision of Article 11, paragraph 5:

> States 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.[10]

On what basis could the international community determine that the exploitation of natural resources was about to become feasible if no one were allowed to prove the commercial practicality of exploiting natural resources until an international regime were established?

On the last day of the 1979 COPUOS session, 3 July, after consensus was reached on the Moon Agreement, S. Neil Hosenball, the U.S. permanent representative to COPUOS, stated:

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[9] Prosper Weil, *Relative Normativity in International Law?*, 77 AM. J. INT'L L. 413-420 (1983) (quoted in Damrosch et al., *supra* note 8, at 58).

[10] Moon Agreement, *supra* note 4, Art. 11.

> The draft agreement-and I am particularly pleased about this, as a member of the National Aeronautics and Space Administration (NASA)-as part of the compromises made by many delegations, places no moratorium upon the exploitation of the natural resources on celestial bodies, pending the establishment of an international regime. This permits orderly attempts to establish that such exploitation is in fact feasible and practicable, by making possible experimental beginnings and, then, pilot operations, a process by which we believe we can learn if it will be practicable and feasible to exploit the mineral resources of such celestial bodies.[11]

Oduntan's erroneous assertion regarding a Moon mining moratorium also overlooks paragraph 65 of the official statement of COPUOS as reported to the United Nations General Assembly in 17 August 1979:

> Following a suggestion for further clarification of article VII, the committee agreed that article VII is not intended to result in prohibiting the exploitation of natural resources which may be found on celestial bodies other than the Earth but, rather, that such exploitation will be carried out in such manner as to minimize any disruption or adverse effects to the existing balance of the environment.[12]

It must be understood that this COPUOS report accompanied the Moon Agreement itself as it was transmitted to the General Assembly, approved by that body, and opened for signature and ratification. Article 31, paragraph 2 of the 1969 Vienna Convention on the Law of Treaties states:

> The context for the purpose of the interpretation of a treaty shall comprise, in addition to the text, including its preamble and annexes:

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[11] UNCOPUOS, 203 mtg., U.N. Doc. A/AC.105/PV.203 (July 3, 1979).

[12] UNCOPUOS, *Report of the Committee on the Peaceful Uses of Outer Space*, ¶65, U.N. Doc. A/34/20 (Aug. 14, 1979).

> (a) Any agreement relating to the treaty which was made between all the parties in connexion with the conclusion of the treaty;[13]

At the very least, paragraph 65 of the COPUOS report should be considered to fall within the meaning of subparagraph 2(a), but arguably it falls within the meaning of the parent paragraph 2 itself, in that the preamble to UNGA Resolution 34/68, the instrument by which the General Assembly opened the Moon Agreement for signature and ratification, and to which the Moon Agreement was annexed, made specific reference to paragraph 65; that is to say, the citation of paragraph 65, being in the preamble of General Assembly Resolution 34/68, preceded the body of the resolution, which in turn preceded the annex of the resolution, which was, to wit, the Moon Agreement. Thus, any opinion contrary to the interpretive declaration of the committee which originated the Moon Agreement is without merit.

There is yet more evidence that the Moon Agreement intended no moratorium on commercial mining. Any statement made in COPUOS without contradiction by another member of the committee is an expression of the consensus of the committee. This is one of the highest sources of interpretation for the Agreement.

> [The agreement] places no moratorium upon the exploitation of the natural resources on celestial bodies, pending the establishment of an international regime. This permits orderly attempts to establish that such exploitation is in fact feasible and practicable, by making possible experimental beginnings and, then, pilot operations, a process by which we believe we can learn if it will be practicable and feasible to exploit the mineral resources of such celestial bodies.[14]

This statement by S. Neil Hosenball, the U.S. permanent representative to COPUOS, "drew no response, and this silence is… a part of the history of the treaty."[15] This U.S. position was made very clear early in the negotiation of the Agreement. Quoting from the

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[13] Vienna Convention on the Law of Treaties, hereinafter the Law of Treaties, May 23, 1969, *entered into force* Jan. 27, 1980, 1155 U.N.T.S. 331 [hereinafter VCLT].

[14] UNCOPUOS, 203 mtg., *supra* note 11, at 22.

[15] Arthur M. Dula, *Free Enterprise and the Proposed Moon Treaty*. 2 HOUS. J. INT'L L. 3, 8–9 (1979).

U.S. statement in the UNCOPUOS Legal Sub-Committee by Herbert K. Reis on 19 April 1973:

> …[A]s I have at this session repeatedly, although I hope politely, made clear, the United States is not prepared to accept an express or implied prohibition on the exploitation of possible natural resources before the international conference meets and agrees on appropriate machinery and procedures and a treaty containing them takes effect. In our view, the Moon agreement cannot reasonably seek to require that exploitation must await the establishment of the treaty-based regime.[16]

Oduntan's assertion notwithstanding, the Moon Agreement does not impose a moratorium on "commercial mining on planets and asteroids until there is an international regime for such exploitation."[17]

III. AN IDEOLOGICAL BATTLE

One statement in Oduntan's opinion editorial is undeniable: an "ideological battle over ownership of the cosmos" is underway.[18] It is an ideological battle, but it is not a legal battle, for the legal bases for his assertions and for those of Jakhu do not exist. Nevertheless, to the extent that they are believed, they gain traction in the popular media, for as Lee Atwater, political consultant for U.S. presidents Ronald Reagan and George H. W. Bush, once said, in politics, "perception is reality." In law, however, this maxim should be as tiny a truth as can be devised by the better angels of our nature; if law is to be truly a science, its prevailing influences should be evidence and logic, rather than politics and rhetoric.

Both Jakhu and Oduntan base their assertions against H.R. 2262 on the Outer Space Treaty, Article II of which states:

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[16] U.S. Representative's statement before the Legal Subcommittee of UNCOPUOS, April 19, 1973. to verbatim record. For the Report of the Subcommittee, see UN COPUOS Leg. Subcomm., *Report of the Legal Sub-committee on the Work of its Twelfth Session*, U.N. Doc. A/AC. 105/115 (Apr. 27, 1973).

[17] Oduntun, *supra* note 3.

[18] *Id.*

> 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.[19]

How should Article II be interpreted? Article 32 of the Law of Treaties states:

> Recourse may be had to supplementary means of interpretation, including the preparatory work of the treaty and the circumstances of its conclusion, in order to confirm the meaning resulting from the application of article 31, or to determine the meaning when the interpretation according to article 31:
>
> (a) Leaves the meaning ambiguous or obscure; or
>
> (b) Leads to a result which is manifestly absurd or unreasonable.[20]

Let us stipulate that the interpretation Article II of the Outer Space treaty according to Article 31 of the Law of Treaties "leaves the meaning ambiguous or obscure, or leads to a result which is manifestly absurd or unreasonable." That the meaning is either "ambiguous or obscure" is evidenced by the differing interpretations of it. However, the notion that the United States, the United Kingdom, a dozen or so other first tier industrialized capitalist states, and several dozen second tier industrialized capitalist states would have knowingly ratified a treaty which provided "that the surfaces and contents of asteroids and other celestial bodies are protected from commercial harvesting," if not "manifestly absurd or unreasonable," must be greeted with considerable skepticism. We then have recourse to the *travaux préparatoires* of the Outer Space Treaty.

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[19] Treaty on Principles Governing the Activities of States in the Exploration of Outer Space, Including the Moon and other Celestial Bodies, *opened for signature* Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

[20] VCLT, *supra* note 13, Art. 32.

IV. *TRAVAUX PRÉPARATOIRES* OF THE OUTER SPACE TREATY

On 7 May 1966, U.S. President Lyndon Johnson proposed a draft treaty on the exploration of the Moon and other celestial bodies, which, according to the White House Deputy Press Secretary, provided:

> The moon and other celestial bodies should be free for exploration and use by all countries. No country should be permitted to advance a claim of sovereignty.[21]

On 11 May 1966, U.S. Permanent Representative to the U.N. Arthur Goldberg gave a written "Outline of Points for Inclusion in Celestial Bodies Treaty" to the Soviet Permanent Representative to the U.N. Nikolaj Fyodorenko. Point 2 was

> that "Celestial bodies should not be subject to any claim of sovereignty.[22]

On 30 May 1966, Soviet Foreign Minister Andrej Gromyko declared in a letter regarding space exploration to U.N. Secretary General U Thant:

> No one State has the right to regard its achievements in this sphere as a basis for claims to dominion over the moon and other celestial bodies or to use those achievements for activities directed against other States,[23]

Additionally, Foreign Minister Gromyko proposed "the conclusion of an international agreement, which could be based on the following principles governing the activities of States in the exploration and conquest of the moon and other celestial bodies," among them:

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[21] *Space Treaty Proposals by the United States and the U.S.S.R*, S. Doc. 65-822, at 1 (1966) (Staff Rep.).

[22] *Id.* at 6.

[23] *Id.* at 4.

> The exploration and use of the moon and other celestial bodies shall be carried on for the good and in the interest of all mankind; the moon and other celestial bodies shall not be subject to appropriation or territorial claims of any kind. [24]

Article 2 of the draft treaty which the U.S.S.R. submitted on 16 June 1966 stated:

> Outer space and celestial bodies shall not be subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.[25]

Article 1 of the draft treaty which the U.S. submitted on 16 June 1966 stated:

> Celestial bodies are free from *[sic]* exploration and use by all States on a basis of equality and in accordance with international law. They are not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by other means.[26]

In a U.S. Senate document dated 28 July 1966, Eilene Galloway provided the following analysis of the Soviet and U.S. drafts of the Outer Space Treaty:

> Articles 1, 2, and 3 are similar in providing for equality of all states and free access, the applicability of international law, international law, and no claims of sovereignty. The U.S. articles apply to celestial bodies while the Soviet articles apply to outer space and celestial bodies. The provisions in both drafts that activities be carried on "in accordance with international law" and that there shall not be claims of sovereignty are similar to the wording of paragraphs in United Nations Resolution 1962 (XVIII), December 13, 1963.[27]

The text of article which Working Group L.7 accepted on 2 August 1966 stated:

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[24] *Id.* at 5.

[25] Letter from U.S.S.R. to U.N. Secretary General, U.N. Doc. A/6352, at 2 (June 16, 1966).

[26] UNCOPUOS Leg. Subcomm., *Report of the Legal Subcommittee on the Work of its Eleventh Session*, U.N. Doc. A/AC.105/35, at 6 (Sept. 16, 1966).

[27] S. Doc. 65-822, *supra* note 21, at 17.

> 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.[28]

Does any of this bring us closer to understanding the intent of Article II? One thing that does stand out is that Article II was one of the earliest articles of the Outer Space Treaty to be reported out of its working group. There appears to have been little, if any, controversy regarding it. It should be recalled that in mid-1966, NASA's schedule of Apollo missions projected a first attempt at a manned landing on the Moon in the first quarter of calendar year 1968, approximately 18 months in the future.[29,30] It was a given that astronauts would obtain lunar samples and transport them to Earth. It is also a fact of history that the Soviet Union hoped to return cosmonauts from the Moon, together with lunar samples, ahead of the United States. Yet there is no record of any controversy regarding the legal ownership of those samples in the Legal Subcommittee of COPUOS. The logical conclusion is that it was understood that any lunar material retrieved by a U.S. Government mission to the Moon would become the property of the U.S. Government, just as any lunar material retrieved by a Soviet Government mission to the Moon would become the property of the Soviet Government. Any notion to the contrary certainly would have generated a discussion which would have left an evidentiary trail; it did not. There is not a shred of evidence in the *travaux préparatoires* of the Outer Space Treaty that it was intended to prohibit reducing lunar material to possession by the act of removing such material from its natural place, whether by a scientific expedition or by a commercial enterprise; scientific expeditions were permitted to do so, and commercial enterprise were not explicitly prohibited from doing so.

The U.S. Senate Committee on Foreign Relations held hearings on the Outer Space Treaty on 7 March, 13 March, and 12 April

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[28] UNCOPUOS Leg. Subcomm., *Interim Report by the Chair,* U.N. Doc. A/AC.105/C.2/L.16, at 8 (Sept. 6, 1966)

[29] Enclosure: Saturn Apollo Applications Launch Schedule, Rev 4/21/66, HSI-142814. Johnson Space Center Archives, University of Houston.

[30] Proposed Apollo launch schedule, Interim Apollo program directive 4-F, dated 11/15/66, HSI-28774. Johnson Space Center Archives, University of Houston.

1967. The following exchange regarding Article II occurred on 7 March:

> Chairman (Senator Clinton Anderson): "Can we go to article II?"
>
> Ambassador Arthur Goldberg: "I will try to run more quickly."
>
> Chairman Anderson: "We will have to or we will never get through with this treaty."
>
> Ambassador Goldberg: "Yes. Article II is a statement that outer space is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means, which means that outer space is the province of mankind. It is complimentary to article I.
>
> Chairman Anderson: "Any further questions?"
>
> Senator Frank Church: "It cannot be claimed for Ferdinand and Isabella."
>
> Ambassador Goldberg: "That is correct."

That was all there was to it; the committee immediately turned to consider Article III. Senator Church's remark is illuminating, in that it was probably an oblique reference to the writings of Jean-Jacques Rousseau:

> When Nuñez Balboa, standing on the seashore, took possession of the South Seas and the whole of South America in the name of the crown of Castile, was that enough to dispossess all their actual inhabitants, and to shut out from them all the princes of the world? On such a showing, these ceremonies are idly multiplied, and the Catholic King need only take possession all at once, from his apartment, of the whole universe, merely making a subsequent reservation about what was already in the possession of other princes.[31]

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[31] JEAN-JACQUES ROUSSEAU. THE SOCIAL CONTRACT, at I 9 (1762; trans. G. D. H. Cole 1782) *available at* http://www.constitution.org/jjr/socon.htm.

In any case, there was no trepidation expressed in the committee hearings that the Outer Space Treaty attempted to overthrow the natural law theory of property. As expressed by John Locke:

> Though the Earth, and all inferior creatures, be common to all men, yet every man has a property in his own person: this no body has any right to but himself. The labour of his body, and the work of his hands, we may say, are properly his. Whatsoever then he removes out of the state that nature hath provided, and left it in, he hath mixed his labour with, and joined to it something that is his own, and thereby makes it his property. It being by him removed from the common state nature hath placed it in, it hath by this labour something annexed to it, that excludes the common right of other men: for this labour being the unquestionable property of the labourer, no man but he can have a right to what that is once joined to, at least where there is enough, and as good, left in common for others.[32]

To assert that the United States Senate would have ratified a treaty in the full understanding that it overturned this principle is "manifestly absurd and unreasonable." The term "national appropriation" referred only to an effortless and immoderate taking beyond present necessity, whether by a State directly or through the agency of a nongovernmental entity subject to its jurisdiction, and the prohibition of "national appropriation" did not in any way derogate the natural law principle of creating property through the mixing of labor and soil.

V. *TRAVAUX PRÉPARATOIRES* OF RESOLUTIONS 1721 (XVI) AND 1962 (XVIII)

There are more *travaux préparatoires* to consider with respect to the term "national appropriation," since that term was not original with the Outer Space Treaty. Preceding the treaty, on 13 December 1963, the United Nations General Assembly adopted Resolution 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space. Principle 3 states:

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[32] JOHN LOCKE, THE TRUE ORIGINAL, EXTENT, AND END OF CIVIL-GOVERNMENT (1689) *available at* http://www.constitution.org/jl/2ndtr00.htm.

> Outer space and celestial bodies are not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.[33]

Preceding Resolution 1962 (XVIII) in turn, on 20 December 1961, the United Nations General Assembly adopted Resolution 1721 (XVI), International Cooperation in the Peaceful Uses of Outer Space. The resolution states two legal principles regarding outer space, the second of which is:

> Outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are not subject to national appropriation.[34]

On 2 December 1961, Australia, Canada, Italy, and the United States of America presented a draft resolution, International Cooperation in the Peaceful Uses of Outer Space. Section A, paragraph 1(b) stated:

> Outer space and celestial bodies are free for exploration and use by all states in conformity with international law, and are not subject to national appropriations by claim of sovereignty or otherwise.[35]

According to the Verbatim Record of the Twelve Hundred and Eleventh Meeting of the First Committee of the United Nations on 5 December 1961, referring to the Report of the Committee on the Peaceful Uses of Outer Space, Mr. Ferreira of Argentina stated:

> As regards the juridical status of outer space, my Government decisively upholds the thesis that this is *res communis omnium extra commercium*. In other words, as the eminent Uruguayan jurist Eduardo Gimenez Arechaga, as pointed out, This space, and objects in it, cannot be occupied or be appropriated by any

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[33] Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, G.A. Res. 1962(XVIII), U.N. Doc. A/RES/1962(XVIII) (Dec. 13, 1963)..

[34] International Cooperation in the Peaceful Uses of Outer Space, G.A. Res. 1721(XVI), U.N. Doc. A/RES/1721(XVI) (1961).

[35] Australia, Canada, Italy, and the United States of America: Draft Resolution, U.N. Doc. A/C.1/L.301, at 2 (Dec. 2, 1961).

> specific State and is free for the common and perpetual use of all States."[36]
>
> …[T]his use must be for [the] benefit of all mankind there must be no occupation or appropriation on the part of any State.[37]

Res extra commercium is a doctrine holding that certain things may not be the object of private rights, and are therefore insusceptible to being traded, and no doubt it means different things to different people. It is beyond the scope of the present work to fully explore the implications of this term since it occurs only once in the *travaux préparatoires,* but it may be pointed out briefly that the high seas beyond exclusive economic zones are subject to a common freedom of exploitation without exercising national sovereignty, yet this does not prohibit the commercial taking of fish.

In the same meeting of the First Committee of the United Nations on 5 December 1961, Mr. Martino of Italy stated:

> To permit full exploitation of outer space for peaceful purposes, a declaration of principles is needed, to be subscribed to by all nations, that outer space and celestial bodies are free and not subject to appropriation by anybody.[38]

Víctor Andrés Belaunde of Peru stated:

> ...[O]uter space cannot be appropriated; it cannot be exploited;[39] it cannot be used exclusively by one Power or one group of Powers with the material means to do so, because there is a human interest involving mankind's right to the use of outer space.[40]

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[36] UNCOPUOS, 16th Sess., 1211 mtg., at 7, U.N. Doc. A/C.1/PV.1211 (Dec. 5, 1961).

[37] *Id.* at 11.

[38] *Id.* at 36.

[39] The statement did not address natural resources specifically, but outer space generally. It expressed no desire to prohibit exploitation, rather it was a statement opposing the monopolization or oligopolization of exploiting outer space. For example, the orbiting of Telstar in 1962 was not to be interpreted as an initial step in the monopolization of satellite telecommunications either by the American Telephone and Telegraph Company or the United States; other entities remained free to also exploit outer space for telecommunications and other purposes.

[40] *Id.* at 42.

> ...[T]he draft resolution sets forth the opinion of all international thinkers, that outer space does not fall within the competence or ownership of any nation....[41]

The *travaux préparatoires* of Resolution 1962 (XVIII) begins with the Summary Record of the First Meeting of the COPUOS Legal Sub-Committee on 28 May 1962, which includes the opening statement of its chairman, Manfred Lachs of Poland:

> A very important principle of law had been confirmed by the resolution, namely, that the jurisdiction of international law and of the United Nations Charter extended to outer space and celestial bodies, which were completely free for exploration and use by all States, and were not subject to national appropriation.[42]

Grigorij Tunkin of the Soviet Union stated that:

> According to that unanimously adopted resolution, international law, including the United Nations Charter, extended to outer space and celestial bodies, which were thus free for exploration and use by all States and were not subject to national appropriation.[43]

Leonard Meeker of the United States said that:

> The General Assembly had adopted a resolution embodying the principles that international law, including the United Nations Charter, applied to outer space and celestial bodies, and that outer space and celestial bodies were free for exploration and use by all States in conformity with international law and were not subject to national appropriation. [44]

On 10 September 1962, the Soviet Union presented a draft Declaration of the Basic Principles Governing the Activities of States Pertaining to the Exploration and Use of Outer Space. Principle 2 stated:

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[41] *Id.* at 52.

[42] UNCOPUOS Leg. Subcomm., 1st mtg., U.N. Doc. A/AC.105/C.2/SR.1, at 4 (June 30, 1959).

[43] *Id.* at 6.

[44] *Id.* at 8.

> 2. Outer space and celestial bodies are free for exploration and use by all States; no State may claim sovereignty over outer space and celestial bodies.[45]

Verbatim records of COPUOS meetings of 11 through 14 September 1962 depict a great deal of Cold War wrangling and vituperation over such issues as potentially harmful experiments (Project West Ford, 9 April 1962; and Project Starfish Prime, 9 July 1962), reconnaissance satellites, and the activities of private enterprise; the issue of national appropriation was mentioned only once in passing,[46] and then only to reiterate its presence in Resolution 1721 (XVI). In the summary records of COPUOS meetings 17 April to 3 May 1963, the issue of national appropriation was mentioned only once in passing,[47] and then only to reiterate its presence in Resolution 1721 (XVI) and its reformulation in the United Kingdom's draft declaration.[48] The inference is that the term was not a matter of controversy, that there was a common understanding of its meaning, and that it was accepted unanimously.

On 24 September 1962, the United States offered a draft Declaration of Principles Relating to the Exploration and Use of Outer Space, in which Principle 3 was:

> Outer space and celestial bodies are not subject to national appropriation.[49]

On 4 December 1962, the United Kingdom submitted its draft, which stated:

> Outer space and celestial bodies are not capable of appropriation or exclusive use by any State. Accordingly, no State may claim sovereignty over outer space or over any celestial body,

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[45] U.S.S.R.: Draft Declaration of the basic principles Governing the Activities of States in the Use and Exploration of Outer Space, U.N. Doc. A/AC.105/L.2, at 1 (Sept. 10, 1962).

[46] UNCOPUOS, 13th mtg., U.N. Doc. A/AC.105/PV.13, at 26 (Feb 21, 1963).

[47] UNCOPUOS Leg.. Subcomm., 18th mtg., U.N. Doc. A/AC.105/C.2/SR.18, at 5 (Apr. 19, 1963).

[48] Letter dated 4 December 1962 from the Permanent Representative of the UK to the UN addressed to the Chairman of the First Committee, U.N. Doc. A/C.1/879 (Dec. 4. 1962).

[49] UNCOPUOS, *Report on the Committee for the Peaceful Uses of Outer Space* U.N. Doc. A/5549, at 12 (sept. 24, 1963).

> nor can such sovereignty be acquired by means of use or occupation or in any other way.[50]

The revised US draft presented on 8 December 1962 showed no change to Principle 3 from the previous draft:

> Outer space and celestial bodies are not subject to national appropriation.[51]

Returning to the analogy of the high seas, they themselves are not subject to national appropriation, yet the fish become property upon being caught. Indisputably, there is a distinction to be made between a region that is subject to a regime and on the other hand the resources that the region contains. The principle that outer space is not subject to national appropriation clearly refers to a region; absent explicit reference to the resources contained within the region of outer space, the application of the non-appropriation principle to the of taking its resources as property is dubious at best.

VI. EXPLOITED RESOURCES AS PROPERTY

The lack of discussion on outer space resources during the 1961-1967 period could be explained away as the negotiators never having thought of considering the legal implications of resource extraction. This would be a more convincing argument with regard to the earlier years, when the Soviet Union and the United States were struggling to launch the first men into outer space, than to the later years, when the Soyuz and Apollo programs were poised to launch their first manned missions and subsequent flights to the Moon were in sight. Even accepting this excuse does not lead to the conclusion that reducing lunar material to possession by the act of removing it from its natural place, whether by a scientific expedition or by a commercial enterprise, would have been prohibited by international law, for *nulla poena sine lege* is a basic legal principle; one cannot be punished for doing something that is not prohibited by law. If, as an error of omission, no one thought to prohibit the appropriation of extracted resources, then doing so cannot be illegal.

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[50] Letter dated 4 December 1962, *supra* note 48, at 10.

[51] Letter dated 8 December 1962 from the representative of the USA to the Chairman of the First Committee, U.N. Doc. A/C.1/881 (Dec. 8, 1962).

In fact, however, this legal problem was considered as early as 1959. The Summary Record of the First Meeting of the *Ad Hoc* Committee on the Peaceful Uses of Outer Space, Legal Committee, held on 26 May 1959, captures a discussion by Mr. Evans of the United Kingdom:

> Celestial bodies in outer space could have the same legal status as outer space itself or could be regarded as a separate problem. Should states be recognized as capable of acquiring sovereignty over them and over their natural resources, or should they be made the subject of some form of international administration? That problem had been posed very clearly by the United States representative in the *Ad Hoc* Committee.[52]

The report of the Legal Committee, dated 27 May 1959, included a working paper submitted by the delegation of the United States:

> The Committee was of the view that the exploration of celestial bodies did not itself present any legal problems distinct from those generally raised by space exploration. Problems would arise only if states claimed, on one ground or another, sovereignty over all or part of a celestial body to the exclusion of other States. It was suggested that celestial bodies are incapable of appropriation to national sovereignty. The view was also expressed that some form of international administration over celestial bodies might be adopted.
>
> It was pointed out that exploration, settlement and exploitation of natural resources raised distinguishable problems, and that only settlement and exploitation raised serious problems of possible claims to sovereignty. These did not appear likely in the near future.[53]

On 9 June 1959, the *Ad Hoc* Committee issued its report:

> The Committee was of the view that serious problems could arise if States claimed, on one ground or another, exclusive rights over all or part of a celestial body. One suggestion was that celestial bodies are incapable of appropriation to national

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[52] *Ad Hoc* COPUOS, 1st mtg., U.N. Doc. A/AC.98/C.2/SR.1, at 7 (June 30, 1959).

[53] *Ad Hoc* UNCOPUOS Leg. Comm., *Report Under Paragraph 1(d) of the GA Res 1348 (XIII)*, U.N. Doc. A/AC.98/L.7, at 8 (May 27, 1959).

> sovereignty. It was also suggested that some form of international administration over celestial bodies might be adopted.
>
> The Committee noted that, while scientific programmes envisaged relatively early exploration of celestial bodies, human settlement and extensive exploitation of resources were not likely in the near future. For this reason the Committee believed that problems relating to the settlement and exploitation of celestial bodies did not require priority treatment.[54]

The exploitation of resources was not mentioned again until 13 June 1969, only five weeks before *Apollo 11's* first manned landing on the Moon, when Argentina raised the "question of the legal status of substances, resources, and products originating from the Moon."[55] The lack of discussion between June 1959 and June 1969 on the legal problems pertaining to the exploitation of natural resources was not an error of omission; rather, it was a deliberate choice. There were much more urgent legal problems that required attention. Thus neither Resolution 1721 (XVI), Resolution 1962 (XVIII), nor the Outer Space Treaty ever addressed the question. This was purposefully left to the negotiation of the Moon Agreement.

VII. AN INTERPRETIVE DECLARATION

In association with H.R. 2262, the U.S. House of Representatives Committee on Science, Space, and Technology expressed the following views:

> U.S. international obligations
>
> The Committee recognizes that the United States is a Party to 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'), as well as the Convention on International Liability for Damage Caused by Space Objects, the Convention on Registration of Objects Launched in Outer Space, and Agreement on the Rescue of Astronauts, the Return of Astronauts and Return of Objects

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[54] *Ad Hoc* UNCOPUOS, *Report of the Working Group to the Legal Committee (Note by the Secretariat)*, U.N. Doc. A/AC.98/C.2/L.1, at 9-10 (June 9, 1959).

[55] U.N. Doc. A/AC.105/C.2/L.54.

> Launched in Outer Space. There is nothing in this title which calls for the United States to violate its existing international obligations under these treaties to which it is a Party or to any other treaty to which it is a Party.
>
> Claims of sovereignty
>
> This title does not claim sovereignty over outer space or any celestial bodies.
>
> National appropriation
>
> Removing, taking possession, and using in-situ celestial resources, including in-situ asteroid resources, is not to be construed as an act of national appropriation by claim of sovereignty, by means of use or occupation, or by any other means.[56]

The committee's view of the term "national appropriation" amounts to a long delayed interpretive declaration regarding Article II of the Outer Space Treaty. It expresses faithfully the understanding which the United States Senate, Arthur Goldberg, and COPUOS had in 1967 as to the meaning of Article II. The U.N. Treaty Handbook provides:

> 3.6.1 Interpretative declarations
>
> A State may make a declaration about its understanding of a matter contained in or the interpretation of a particular provision in a treaty. Interpretative declarations of this kind, unlike reservations, do not purport to exclude or modify the legal effects of a treaty. The purpose of an interpretative declaration is to clarify the meaning of certain provisions or of the entire treaty.
>
> 3.6.3 Time for formulating declarations
>
> Declarations are usually deposited at the time of signature or at the time of deposit of the instrument of ratification, acceptance, approval or accession. Sometimes, a declaration may be lodged subsequently.

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[56] Space Resource Exploration and Utilization Act of 2015, H.R. Rep. No. 114-153 (2015).

> 3.6.4 Form of declarations
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> Since an interpretative declaration does not have a legal effect similar to that of a reservation, it need not be signed by a formal authority as long as it clearly emanates from the State concerned. However, since a doubt could arise about whether a declaration in fact constitutes a reservation, a declaration should preferably be signed by the Head of State, Head of Government or Minister for Foreign Affairs or a person having full powers for that purpose issued by one of the above authorities.[57]

Although it may be unusual for a state to make an interpretive declaration regarding a treaty long after its ratification, it is permitted under international law. The bill which was the subject of the Committee's views was signed into law by the President, who is both Head of State and Head of Government. Even so, it would be preferable for the President to send a communication to the Secretary of State reflecting the views of the Committee and directing him to list the interpretive declaration of the Government of the United States, which, pursuant to Article XIV of the Outer Space Treaty, is one of the Treaty's three Depositary Governments.

It should be noted that to date no State Party to the Outer Space Treaty has lodged a declaration asserting the illegality of reducing to possession any obtained space resources.

VIII. CUSTOMARY INTERNATIONAL LAW

The customary international law regarding property rights in outer space was evidenced by the retrieval of lunar material by American manned *Apollo* missions and Soviet unmanned *Luna* missions during 1969-1973. There was never a serious challenge to the ownership of this material by these two states, and in some cases title has since been transferred to other owners, including private persons.[58] This is evidence of an emergent custom in international law which follows the natural law principle of mixing labor

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[57] UNITED NATIONS, TREATY HANDBOOK (2012) available at https://treaties.un.org/doc/source/publications/THB/English.pdf.

[58] There was some discussion on whether it was appropriate for receiving heads of state/government to act as if given Moon rocks were indeed their personal possession, and not something more of a trophy received on behalf of their respective state; however, this question would need to be addressed in the receiving state's municipal law; however,

and soil to create a property right that is transferable. Although the evidence of such a custom would have been stronger had the exploration of the lunar surface continued and had additional material been extracted and reduced to possession, the fact remains that there is no evidence of state practice contrary to such a custom. The 381 kilograms of lunar material, which has been on Earth as property since the 1970s, certainly carries some weight in international law.

IX. *TRAVAUX PRÉPARATOIRES* OF THE MOON AGREEMENT

The Moon Agreement codifies this emergent custom. The provision that does so, the first sentence of Article 11, paragraph 3, is clumsily worded:

> 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.[59]

The key phrase is "in place," and when reworded to be a positively phrased statement rather than a negatively phrased one, it becomes clear that natural resources removed from their place may become property. Again, this follows the natural law principle. Again, it is inconceivable that the government of any capitalist state, including the United States, would have adhered to any interpretation to the contrary at the time that it negotiated the Agreement. Hosenball restated the provision in a more straightforward way, and it is documented that no other state contradicted his statement.

> [T]he words "in place"... are intended to indicate that the prohibition against assertion of property rights would not apply to natural resources once reduced to possession through exploitation either in the pre-regime period or, subject to the rules and

there was no doubt in international law that the Moon rocks were property of the donating state to give, and for some national entity of the other state to receive.

[59] Moon Agreement.