

AUTONOMOUS SETTLEMENTS AND ENVIRONMENTAL PROTECTION IN THE LAW OF OUTER SPACE

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ABSTRACT

The establishment of permanent habitats in space and on celestial bodies will require consideration of the form and structure of local governmental systems, perhaps leading to autonomy as the preferred modality. The inter-relationships between independent settlements and the global community will present unique and novel juridical challenges. The applicability and even suitability of

terrestrial legal regimes must be determined. However, the parameters of authority of self-governing entities must be identified, especially in regards to matters of environmental protection and preservation. This paper examines these issues in the context of the *corpus juris spatialis*.

INTRODUCTION

The 21st century will enable mankind to achieve one of its oldest dreams and ambitions: to live among the moons and planets of the solar system and beyond. The exploration and use of celestial bodies will present profound issues of ethics, philosophy and jurisprudence. Primary among the concerns of international law will be the legal infrastructure to regulate the activities of man in the settlement of space.

Various factors must be considered in structuring an internal legal regime sufficient to achieve the intended goals of any mission. In regard to permanently inhabited facilities, these include the maintenance of internal order, and

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the promotion of the physical, psychological and emotional health of the individual residents of the settlement. Although the local government structure will be unique to each facility, and mature and evolve with changing circumstances, increasingly it has been recognized that autonomy will be the preferred modality.¹

Autonomy generally has been viewed in the context of the relationships between the settlement and states and other terran entities. However, there also will be interactions and interrelationships between the settlement and the natural celestial environment which must be considered. "In human permanent space settlements respect must be the major principle to be observed by settlers and off-settlement persons and among one another, and between settlers and outer space and celestial bodies' environments."² Thus, the applicability of the *corpus juris spatials* to the settlement must be examined, with an emphasis on environmental protection.

ESSENTIAL CONCEPT OF SPACE SETTLEMENT

The establishment of settlements on celestial bodies necessarily will pass through several stages of development and progression. The first landing parties will remain for relatively brief periods, while subsequent explorations will conduct missions of increasingly longer duration, and build upon the experiences, procedures and technologies of their predecessors. Ultimately, the station or facility will mature and be transformed into a settlement, the essential characteristic of which is permanence. That is, the residents are comprised of individuals, some of whom will come from Earth, while others will be born *in situ*, or en route, or even come from other settlements or facilities, but all of whom share the intention to remain indefinitely. These

permanent settlements largely will be self sufficient, utilizing natural celestial materials for necessities of life, and engaging in trade with Earth and other settlements, stations and facilities.

Early explorations will be driven, in large part, by scientific purposes, and conduct a variety of experiments and examinations, especially in the search for evidence of life and keys to the origins of life. The recent discoveries of water on the Moon and other celestial bodies, together with the apparent prevalence of organic compounds throughout the solar system, indicate that all celestial bodies are biologically interesting, and potential candidates for the search for the origins of life.³

Geological surveys, chemical analyses, mapping programs, and other studies will be performed on celestial bodies, and natural celestial materials will be returned to Earth for study. Moreover, manned missions will utilize natural celestial resources to the greatest extent feasible and permissible for support of the mission, including materials for construction of settlements or other facilities, and extraction of consumable substances for life support or fuel supplies.

DISRUPTION OF PRISTINE CELESTIAL ENVIRONMENTS

It must be noted at the outset that it is inevitable that the exploration of celestial bodies will cause some level of impact on the natural environment.⁴ Space suits may protect astronauts from celestial environments, but what will protect the celestial environments from the astronauts? In general, any impact upon the pristine environment of a celestial body could be considered adverse, harmful, or disruptive. The manned and unmanned craft which have landed on the Moon have altered the natural environment of the lunar surface by

scattering medallions, leaving the tracks of roving vehicles, and the remains of used and expended craft which have soft landed or crashed onto the surface.⁵ Future interplanetary missions of exploration and settlement of the Moon and other celestial bodies will cause further disruption to natural environments.⁶

The integrity of scientific studies directly depends upon the preservation of the environmental *status quo ante intrus*. In addition to the physical intrusion and disruption of the natural celestial environment are the consequences of biological contamination.⁷ The introduction of organic substances to a celestial body would jeopardize permanently the integrity of scientific investigation relative to the search for indigenous forms of life, or the remnants or precursors thereof. One need look no further than the example of the Galapagos Islands for proof of the deleterious effects introduced species can produce on indigenous forms of life. The necessity for protection of natural celestial environments is not open to serious dispute.⁸

The protection and preservation of the natural environments of space and celestial bodies properly is considered as an extension of the principle of the common heritage of mankind.⁹ That is, the interests to be promoted by ensuring the continued existence of pristine environments are common to all states, populations, and generations. Foremost is the precept that the environment is provided to man, but any alteration thereof or intrusion thereto is a cultural product. Mankind's modification to the environment may be a positive change, such as by dams, reinforcement of natural formations, or protections for endangered or threatened species of flora or fauna. However, contamination, pollution or any other hazardous intrusion constitutes a trespass against the security of nature and future scientific study.

The interests in the prevention of organic as well as physical contamination of celestial environments transcend national boundaries and political philosophies. The potential for catastrophic injury to natural environs and indigenous life is substantial. No individual state, or group of states, may have the necessary resources, either technological or economic, adequately to cope, remedy or compensate for such damage.¹⁰ Moreover, these interests are not static in time, as it is implicit that outer space, including Earth, the Moon, and other celestial bodies, belong to future generations as well as the one which currently populates this planet. The challenge is to find a "[s]ustainable balance between the productive activities of mankind and the desire to retain the purity of the space environment."¹¹

Environment is a concept inseparable from life. Thus, what must be studied is life and its needs, risks and possibilities on Earth, in outer space or on any other celestial body. Mankind has committed serious mistakes in the exploitation and use of the terran environment, and one can only imagine what would be the results of manipulating an alien environment. The goal of a settlement in space should focus on the adaptability of man, and attempt to avoid the lure of pretended terranization with unknown consequences.

THE IMPERATIVE OF AUTONOMY

The legal infrastructure which will be appropriate for each specific facility on a celestial body must be derived from the consideration of numerous factors, including the purposes and the intended duration of the mission, the nationalities of the crew members, the size of the crew complement, and the political policies of the entity or entities conducting the mission.¹² This legal structure is grounded in article VIII of the Outer Space

Treaty, which provides that launching states have the right to exercise exclusive and continuing jurisdiction and control over their personnel, even while in outer space.¹³

The exclusive jurisdiction provided by article VIII of the Outer Space Treaty may be sufficient for landings of short duration, or even longer missions with rotating crews.¹⁴ However, the imposition of control from Earth pursuant to article VIII will be inadequate to deal with the inherently local concerns of a permanently inhabited settlement, and ultimately will be unjust in its application.¹⁵ The settlers themselves will be affected most directly by decisions concerning local matters, including the maintenance of internal security, order, and significantly, the rights of the individual inhabitants. The inhabitants will be in a preferred position to make such determinations more efficaciously and equitably. Therefore, the right of the inhabitants of a permanent settlement on a celestial body to achieve autonomy and exercise exclusive jurisdiction and control over their political city-state in space should be recognized by the international community.¹⁶

Francisco de Vitoria recognized the right of every person in the world, the *ius peregrinandi* that allows one to go anywhere on the planet and fix residence in any part, land, country or reign. This *ius* was part of a broader one: the *ius communicationis*. The latter derived from a conception of natural society based on the supreme principles of justice, universal brotherhood, love and charity.¹⁷

The creation of a human settlement on a celestial body raises the issue of the common good to be achieved, in accordance with the objective of the settlement. A permanent settlement in space will be a society, not merely a group of individuals. Autonomy, it has been

noted, "does not mean solitude, it implies own-organization, and respect toward the other fellow. Besides that, it is the exercise of Mankind's right to live in the Cosmos."¹⁸ History consistently has demonstrated the inherent desire of man to control his own destiny, and practice democracy and self-government. There is no reason to assume that human settlers on celestial bodies will not share this desire. Indeed, the isolation of the settlers, and the necessity for a settlement to achieve maximum self-sufficiency, likely will accelerate the aspirations of the inhabitants to exercise self-government, and rebel at the imposition of detached control by a terran entity hundreds of thousands if not hundreds of millions of miles from their home. The settlers themselves will be in a position to develop interrelationships and new ways of living, and seek to avoid repeating the mistakes of the past.

APPLICABILITY OF THE *CORPUS JURIS SPATIALIS* TO AUTONOMOUS SETTLEMENTS

It is clear that the *corpus juris spatialis* will be applicable to any facility established and operated by terran states. But when the settlement commences the exercise of exclusive jurisdiction and control, it may be questioned whether "there [are] any principles of the *corpus juris spatialis* which might be applied to life of man in space - both outside a space vehicle and in a space station - just as they are established in the five space treaties? Is it necessary to create a new legal regime? In said case, shall each settlement be empowered to create its own legal statute? Is it necessary to give general guidelines within which space settlers shall be able to frame their statute?"¹⁹

The extant space treaties, by definition, are agreements between states, each of which accepted and became party to one or more of the instruments upon a determination of their

individual, sovereign national policy. An autonomous settlement on a celestial body will not necessarily be a sovereign state in the traditional sense,²⁰ and therefore could stretch the notion of “state party” to a treaty. Moreover, the space treaties were not drafted with the intention that non-terrestrial entities may be able to become party thereto, and may require amendment to allow for such eventualities.²¹ It previously has been noted that the recognition by the international legal community of the authority of an autonomous settlement could best be established by means of an *International Agreement of Recognition and Capacity* (IARC).²² The IARC would enable the settlement to effectively exercise the attributes of independence and self-government, and govern the inter-relationships with other states and entities

The IARC should include an acknowledgment by the launch state and the settlement of the obligations of the *corpus juris spatialis* to which the settlement agrees to be bound. These obligations can be viewed as rights of the founding entity, and the global community, which must be observed and respected by the settlement. The settlement autonomy would include the recognition of the human condition for those born in the settlement. The recognition of humanity is *conditio sine qua non* to maintain the continuity of the *corpus juris spatialis*, as the only subject of rights and duties in the *corpus juris spatialis* is humankind.

The existence of an IARC is not the only basis by which the settlement could be subject to international legal requirements. Specifically, the doctrines of both *jus cogens* and customary international law could be applied to an autonomous settlement under appropriate circumstances.²³

The doctrine of customary international law provides that a long standing custom and practice of states may become elevated to a legally binding obligation of all nations, even if such custom and practice is not contained within a treaty or other express international agreement.²⁴ The principle of *jus cogens*, on the other hand, provides that there are certain obligations which are considered as preemptory norms, from which no deviation can be permitted, and thereby binding on all states. What constitutes a preemptory norm must be determined on a case by case basis, with consideration of the particular circumstances, especially where the rights of other states or the potential for threats to human life or international peace and security are concerned.²⁵

The Outer Space Treaty has been in force for more than three decades. This international agreement has been ratified and accepted by almost all the nations of the Earth, including the space-active states. Furthermore, the practice of states has been consistent with and in conformity and compliance with the provisions of the Outer Space Treaty, even in advance of the entry into force of the instrument. Therefore, the Outer Space Treaty could provide the foundation for binding obligations pursuant to customary international law.

The Moon Agreement has not received the same acceptance as has the Outer Space Treaty. Only a handful of states, which do not include most space-active nations, have signed or ratified the treaty. Furthermore, only a few missions to the Moon have been conducted since the entry into force of the Moon Agreement. Thus, it cannot yet be said that the Moon Agreement has engendered the long standing practice of states sufficient to rise to the level of customary international law.

Nevertheless, both the Moon Agreement and the Outer Space Treaty contain provisions which could be found to be predicated upon preemptory norms, and therefore binding in accordance with the doctrine of *jus cogens*.

The Charter of Mankind,²⁶ first proposed in 1992, embodies a declaration of obligations believed to be universal and immutable in nature. The Charter is a codification of principles which are considered binding on mankind in space, whether in the context of a settlement or not, as a matter of customary international law or as preemptory norms. Included among the Charter are principles of peaceful purposes, international cooperation, and freedom of exploration and use. The Charter also contains principles of environmental protection which are consistent with the provisions of the *corpus juris spatialis*.²⁷

ENVIRONMENTAL PROTECTION IN THE *CORPUS JURIS SPATIALIS*

The primary expression of environmental protection in the *corpus juris spatialis* is set forth in article IX of the Outer Space Treaty. This article provides that states shall pursue studies and conduct exploration of outer space, including the Moon and other celestial bodies, so as to avoid their harmful contamination and adverse changes to their environment. The terran entity founding the settlement likely will be a party to the Outer Space Treaty, and therefore subject to the requirements of article IX as a matter of positive international law. It is submitted that an autonomous settlement also will be required to comply with this environmental protection provision, at least as a matter of customary international law if not by voluntary agreement such as by means of an IARC.

The Moon Agreement goes further than the requirements of the Outer Space Treaty, and obligates states to prevent the disruption of natural celestial environments. Such disruption

can occur by the introduction of adverse changes to that environment, by harmful contamination, or by some other, unspecified means.²⁸ The phrase "disruption of the environment" is more extensive than the concept of "harmful contamination" as expressed in the Outer Space Treaty. Thus, the language of the Moon Agreement makes it clear that harmful contamination is but one form of environmental disruption.

The *corpus juris spatialis* provides that launching states may conduct a wide range of activities on celestial bodies which are peaceful and otherwise in accordance with international law.²⁹ The Moon Agreement expressly permits states parties to collect and remove samples of the lunar surface and subsurface,³⁰ to land objects on and launch them from the Moon,³¹ and to place and freely move their personnel, vehicles, equipment, facilities, stations, and installations on or below the lunar surface or subsurface,³² notwithstanding that such activities will disrupt the pristine celestial environment.

The Moon Agreement recognizes that the impact of activities on celestial bodies should be limited in relation to both disrupting or contaminating the environment, as well as in regard to possible alterations caused by the physical intrusion of the mission. This recognition is expressed in Article 9, which provides that states establishing stations on the surface or subsurface of the Moon shall use only that area which is required for the needs of the station or other facility.³³

It cannot be stated categorically at the present time that these provisions of the Moon Agreement are, or will become, customary international law. Similarly, it would not appear that these provisions would receive universal acceptance as preemptory norms, binding pursuant to the doctrine of *jus cogens*.

The Moon Agreement contains certain provisions which could be considered as obligatory as a matter of *jus cogens*. Specifically, article 3 prohibits the placement of nuclear weapons or other weapons of mass destruction in a trajectory to, in orbit around, or on the surface of celestial bodies. In addition, the testing of weapons, the establishment of fortifications, and the use of force on the Moon are prohibited. These provisions are similar but more extensive than the prohibitions contained in article IV of the Outer Space Treaty, and have significant implications for environmental damage. There can be no doubt that these provisions are absolutely essential for the maintenance of peace and security, and that a violation thereof would not be tolerated by the international community, without regard to whether the violating state was a party to any particular treaty or instrument.

The inherent right of an autonomous settlement to protect and defend itself³⁴ may appear to be in conflict with the prohibitions on military activities which are considered applicable pursuant to *jus cogens*. There is, of course, a distinction between the placement of weapons of mass destruction in orbit or on a celestial body, which is a threatening, provocative and potentially offensive activity, and activities which are conducted solely for purposes of self-defense.

It is clear that an autonomous settlement will have a direct, substantial and fundamental interest in the protection and preservation of the natural celestial environment. This interest may give rise to a claim of greater rights for the settlement in the use of the celestial body, and the natural resources of outer space and celestial bodies, *vis-à-vis* terran states. The specific manifestations of this interest must await future events and circumstances. It is possible, however, that an autonomous settlement will feel

somewhat “proprietary” toward its home celestial body.

Notwithstanding issues of appropriation, and concerns over restrictions on freedom of use and exploration, a settlement could seek to impose its own requirements for protection of the celestial environment upon terran entities or others conducting activities on the celestial body. In this regard, a settlement could consider the home celestial body to be analogous to an international scientific preserve, and subject to heightened levels of environmental protection than otherwise may be established by the *corpus juris spatialis*.³⁵ The settlement may have a greater right to limit activities adjacent to the areas it is utilizing than to activities further distant or to craft in orbit. Nevertheless, certain activities could present a threat to the environment on a planetary scale. Accordingly, this situation presents a new context of implication for the old debate on delimitation.

CONCLUSIONS

- The right of mankind to establish space settlements is inherent to the human condition.
- The recognition of the autonomy of a space settlement is a *conditio sine qua non* for the unity of the *corpus juris spatialis*.
- The International Agreement of Recognition and Capability (IARC) implies the observance and reciprocal recognition of the individual, civil and political rights of the subjects born or settled both on Earth and celestial bodies.
- Certain principles of the *corpus juris spatialis*, including environmental protection provisions, could apply to the

activities of an autonomous space settlement, whether by voluntary agreement or by application of the doctrines of *jus cogens* or customary international law.

Endnotes

1. See generally Esquivel de Cocca, *Human Society on Mars: New Legal Needs for a Different Mankind*, in PROCEEDINGS OF THE 35TH COLLOQUIUM ON THE LAW OF OUTER SPACE 335 (1993)[hereinafter referred to as Esquivel de Cocca, "Human Society on Mars"]; DeSaussure & Ulrich, *Transition of Control and Jurisdiction Over Space Settlements*, in PROCEEDINGS OF THE 34TH COLLOQUIUM ON THE LAW OF OUTER SPACE 55 (1992); Fasan, *Human Settlements on Planets: New Stations or New Nations*, 22 J. SPACE L. 47 (1994); G.N. PATTERSON, PRIORITIES IN GEOLUNAR SPACE (1989); G.S. ROBINSON, LIVING IN OUTER SPACE (1975); G.S. ROBINSON & H. WHITE, JR., ENVOYS OF MANKIND (1986); Sterns & Tennen, *The "Art of Living in Space:" A Preliminary Study*, in PROCEEDINGS OF THE 21ST COLLOQUIUM ON THE LAW OF OUTER SPACE 245 (1979)[hereinafter referred to as Sterns & Tennen, "The Art of Living in Space"]; Tamm, *Outer Space Colonization: A Planned Unit Development*, in PROCEEDINGS OF THE 22ND COLLOQUIUM ON THE LAW OF OUTER SPACE 217 (1980).
2. Esquivel de Cocca, *Human Society on Mars*, *supra* note 1, at 340.
3. See Sterns, *The Scientific/Legal Implications of Planetary Protection and Exobiology*, in PROCEEDINGS OF THE 42ND COLLOQUIUM ON THE LAW OF OUTER SPACE 483 (2000).
4. See Williamson, *Planetary Spacecraft Debris - The Case for Protecting the Space Environment*, in PROCEEDINGS OF THE 42ND COLLOQUIUM ON THE LAW OF OUTER SPACE 445 (2000).
5. *Id.* at 446.
6. See Vondrak, *Environmental Modification by Lunar Base Activities*, in 77 SCIENCE AND TECHNOLOGY SERIES, SPACE SAFETY AND RESCUE 1988-1989 375 (G. Heath ed. 1990).
7. Williamson, *supra* note 4, at 448.
8. See Sterns & Tennen, *Recent Developments in the Planetary Protection Policy: Is the Outer Space Environment at Risk?*, in PROCEEDINGS OF THE 32ND COLLOQUIUM ON THE LAW OF OUTER SPACE 163 (1990); see also Stever, HUMAN EXPLORATION OF SPACE - A REVIEW OF NASA'S 90 DAY STUDY AND ALTERNATIVES, NATIONAL RESEARCH COUNCIL, (1990), cited in DeVincenzi, *Planetary Protection Issues and the Future Exploration of Mars*, in 12 ADV. SPACE RES., No. 4, 121 (1992); COSPAR Res. 26, COSPAR INFO. BULL. at Annex 4 (1964); *Biological Contamination Control for Outbound and Inbound Planetary Spacecraft*, NASA MANAGEMENT INSTRUCTION 8020.7A (1988).
9. See generally Cocca, *Environment as a Common Heritage of Mankind*, in PROCEEDINGS OF THE 32ND COLLOQUIUM ON THE LAW OF OUTER SPACE 71 (1990); see also Cocca, *The Principle of the "Common Heritage of Mankind" as Applied to Natural Resources*

from *Outer Space and Celestial Bodies*, in PROCEEDINGS OF THE 16TH COLLOQUIUM ON THE LAW OF OUTER SPACE 172 (1974).

10. See Esquivel de Cocca, *International Liability for Damages Caused by Persons or Space Objects in Outer Space or on Celestial Bodies to Persons, Properties or Environment in Outer Space or Celestial Bodies*, in PROCEEDINGS OF THE 42ND COLLOQUIUM ON THE LAW OF OUTER SPACE 55 (2000)[hereinafter referred to as Esquivel de Cocca, "International Liability"]].

11. Williamson, *supra* note 4, at 449.

12. See Sterns & Tennen, *Jurisprudential Philosophies of the "Art of Living in Space:" The Transnational Imperative*, in PROCEEDINGS OF THE 25TH COLLOQUIUM ON THE LAW OF OUTER SPACE 187 (1983).

13. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, *opened for signature* January 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205, *text reproduced in* UNITED NATIONS TREATIES AND PRINCIPLES ON OUTER SPACE 3 (1999)[hereinafter referred to as the "Outer Space Treaty"].

14. See Sterns & Tennen, *International Recognition of the "Art of Living in Space:" The Emergence of Settlement Competence*, in PROCEEDINGS OF THE 22ND COLLOQUIUM ON THE LAW OF OUTER SPACE 221 (1980)[hereinafter referred to as Sterns & Tennen, "International Recognition"]].

15. See Sterns & Tennen, *The Art of Living in Space*, *supra* note 1.

16. *Id.*

17. The rights comprehended in the *ius* included the right to enter, transit or peregrinate to foreign countries; the right to utilize the natural common goods; the right and duty to admit foreigners; the right of residence in a foreign country; the right to fix residence in said foreign countries and acquire nationality there whether by marriage or any other legal means; the right of the foreigners to an equal treatment with citizens; and the right to stay and not to be expelled without a just cause. Francisco de Vitoria, *Relectio de Indis*, in V HÁBEAS HISPANORUM DE PACE CXXXIX (ed. Luciano Pereña 1967); *see also* Ramón Hernández, *Un español en la ONU*, 152 *et seq.* (ed. BAC Popular 1977).

18. Esquivel de Cocca, *Human Society on Mars*, *supra* note 1, at 340, *citing* Table IX, Buenos Aires Declaration of the XII Tables of Mankind (11 November 1989).

19. *Id.* at 336.

20. Sterns & Tennen, *International Recognition*, *supra* note 14.

21. Esquivel de Cocca, *International Liability*, *supra* note 10, at 52, 56-8; Esquivel de Cocca, *Human Society on Mars*, *supra* note 1, at 337-39.

22. See Sterns & Tennen, *International Law and 'The Art of Living in Space:' The Recognition of Settlement Autonomy*, 9 SPACE POLICY 213 (1993).

23. The Vienna Convention on the Law of Treaties, *entered into force* January 27, 1980, U.N. Doc. A/CONF.39/27, 63 AM. J. INT. L. 874 (1969), 8 I.L.M. 679 (1969), expressly recognizes the principles of *jus cogens* and customary international law in the following articles: art. 38 (nothing in arts. 34 through 37 relating to treaties and third states precludes the

application of customary international law); art. 43 (obligations imposed by international law independent of a treaty); art. 53 (treaties conflicting with a preemptory norm of general international law (*jus cogens*)); art. 64 (treaties which conflict with the emergence of a new preemptory norm of general international law (*jus cogens*) are void and terminated); and art. 71 (consequences of the invalidity of a treaty which conflicts with a preemptory norm of general international law).

24. See M.M. WHITEMAN, 1 DIGEST OF INTERNATIONAL LAW 75-90 (1971).

25. See Christol, *Judge Manfred Lachs and the Principle of Jus Cogens*, 22 J. SPACE L. 33 (1994). It can be asserted that preemptory norms, from which no deviation can be permitted, are or should be binding upon all sentient beings, whether human or extraterrestrial. Indeed, the concept of *jus cogens* can be said to be the foundation for metalaw. See generally E. FASAN, RELATIONS WITH ALIEN INTELLIGENCES (1970); but see Sterns, *SETI and Space Law: Jurisprudential and Philosophical Considerations for Humankind in Relation to Extraterrestrial Life*, 46 ACTA ASTRONAUTICA 759 (2000).

26. Charter of Mankind, text reproduced in Esquivel de Cocca, Human Society on Mars, *supra* note 1, at 343.

27. *Id.* at Principles II, III and IV.

28. Agreement Governing the Activities of States on the Moon and Other

Celestial Bodies, entered into force July 11, 1984, art. 7, 1363 U.N.T.S. 3, text reproduced in UNITED NATIONS TREATIES AND PRINCIPLES ON OUTER SPACE 22 (1999), and 18 I.L.M. 1434 (1979)[hereinafter referred to as the "Moon Agreement"].

29. *Id.* at arts. 2, 3; Outer Space Treaty, *supra* note 13, at art. I.

30. Moon Agreement, *supra* note 28, at art. 6, ¶ 2.

31. *Id.* at art. 8, ¶ 2(a).

32. *Id.* at art. 8, ¶ 2(b).

33. Unfortunately, neither the Outer Space Treaty nor the Moon Agreement establish any procedures for reparation or compensation for damage or violation of these environmental provisions. "As it has not been established been (sic) the procedure of legal reparation, the principle loses strength. We could say that the lane is drawn but a highway is needed." Esquivel de Cocca, International Liability, *supra* note 10, at 51.

34. See United Nations Charter, opened for signature October 24, 1945, art. 51, 59 Stat. 1031; T.S. 993, 3 Bevans 1153.

35. This approach would be opposite that expressed in article 7, paragraph 3 of the Moon Agreement, *supra* note 28, wherein an international scientific preserve may be established as the exception rather than as the rule.