This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

IISL-98-IISL.1.04

INSTITUTIONAL APPROACHES TO MANAGING SPACE RESOURCES

By Patricia M. Sterns* and
Leslie I. Tennen**
LAW OFFICES OF STERNS AND TENNEN*
Attorneys and Counselors at Law
Phoenix, Arizona USA

ABSTRACT

Pressure is rapidly building on the international community to establish a legal regime applicable to the exploitation of space resources. The transformation of space programs from the public to the private sector necessarily shifts the focus of activities from scientific investigation and national prestige to considerations based on a return on investment. Many proposals have been made for a legal framework under which natural space resources could be utilized for commercial purposes. The possible options range from a laissez-faire philosophy, where the first in time has total and unfettered control over resources on celestial bodies, to the complete prohibition of all commercial use of extraterrestrial materials. Unfortunately, misconceptions abound, and not all of these options would promote the peaceful movement of mankind into the cosmos.

The international community has recognized the necessity of establishing appropriate regulation of the use of celestial resources, by the law of outer space in general, and the Moon Treaty in particular. Although the Moon Treaty has entered into force, the instrument has been ratified by only a handful of nations. Nevertheless, the Moon Treaty identifies the fundamental policies to be served by an "international regime" to govern the exploitation of extraterrestrial resources. This article examines the range of alternatives potentially available for this purpose in relation to the international policies as articulated in the *corpus juris spatialis*. Recommendations are made for the peaceful and orderly exploration and use of outer space, including the Moon and other celestial bodies.

INTRODUCTION

The decline of government involvement in operational space programs in recent years has focused renewed attention on the necessity for creation of an acceptable legal environment in which the private sector can utilize its formidable

* Member IAA, IISL, ASIL, ABA, IBA, ILA
Senior Member AIAA

** Commissioner, Arizona Space Commission
Member IAA, IISL, IEAS, ASIL, ILA
Senior Member AIAA

* Member IAF, IISL

© STERNS AND TENNEN 1998

The opinions expressed in this article are those of the authors only and should not be attributed to any organization with which they may be affiliated

Copyright © 1998 by the authors. Published by the American Institute of Aeronautics and Astronautics, Inc., with permission. Released to AIAA to publish in all forms.

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

abilities to use and exploit space resources for commercial gain. Numerous commentators have examined the broad range of issues thus presented, and proposals have been made which purport to provide appropriate mechanisms for the commercialization of space. Unfortunately, assumptions and misconceptions abound.

This article identifies the fundamental policies expressed in the *corpus juris spatialis* applicable to the use and exploitation of natural space resources. Examples of the diverse range of proposed juridical regimes to managing space resources are identified and examined in relation to these fundamental policies, together with recent developments in the analogous areas of the Law of the Sea and the dispute resolution procedures of the World Trade Organization. Finally, suggestions are made for the development of appropriate legal mechanisms to regulate the commercialization of space.

COMMERCIAL USE OF SPACE AND THE COMMON HERITAGE OF MANKIND

There is general agreement that the commercial development of outer space resources is dependent upon the establishment of a reliable and predictable legal regime. The concept of the *common heritage of mankind*, as reflected in the Moon Treaty,[1] together with the "sharing of benefits" referred to therein present a substantial degree of uncertainty to this endeavor. Indeed, it is the common heritage of mankind provision which has been blamed for the lack of acceptance and ratification of the Moon Treaty by all but a handful of states.[2] Nevertheless, a sufficient number of states have ratified the Moon Treaty such that the instrument entered into force in 1984.

The focus of many of the authors in recent years has been on the establishment of "property rights" in or over space resources which may be exercised by private ventures.[3] This has devolved into discussions of the non-appropriation doctrine as expressed in article II of the Outer Space Treaty, which provides that outer space, including the Moon and other celestial bodies, is not subject to national appropriation.[4] Certain proponents of space commercialization have attempted to argue away the application of the non-appropriation doctrine to private entities in general, or to favored projects in particular.[5] As an alternate position, some commentators have urged that the entire Outer Space Treaty be scrapped, as presenting an insurmountable obstacle to profit-making activities.[6] Neither of these approaches

---

1. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, *entered into force* July 11, 1984, 1363 U.N.T.S. 3, *text reproduced in* UNITED NATIONS TREATIES AND PRINCIPLES ON OUTER SPACE 28 (1997), *and* 18 I.L.M. 1434 (1979)[hereinafter referred to as the "Moon Treaty"].

2. *See* Gorove, *Space Resources and the Developing Nations A Legal Assessment*, in INTERNATIONAL SPACE LAW MISCELLANEA (Liber Americorum Honouring Prof. Dr. A. Górbiel) 97 (E.J. Palyga ed. 1995); *see also* Galloway, "Status of the Moon Treaty," 9 *Space News* 21 (Aug. 3-9, 1998).

3. The rationales proffered by some of these proposals can be described as cromulent, while others are more specious.

4. 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 4 (1997)[hereinafter referred to as the "Outer Space Treaty"].

5. *See, e.g.*, White, *Real Property Rights in Outer Space*, PROCEEDINGS OF THE 40TH COLLOQUIUM ON THE LAW OF OUTER SPACE 370, 379 (1998); Wasser, *The Law That Could Make Privately Funded Space Settlement Profitable*, 5 SPACE GOVERNANCE 55 (1998).

6. *See* Quiat, *Financing Infrastructure for Space Stations and Related Business Development*, 5 SPACE GOVERNANCE 176 (1998); O'Donnell, Robinson & Robinson, *This Treaty Needs a Lawsuit*, PROCEEDINGS OF THE 40TH COLLOQUIUM ON THE LAW OF OUTER SPACE 185 (1998). The dissatisfaction with the Outer Space

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

are necessary, and may be antithetical to the use and exploitation of space resources.

The focus on "property rights" usually proceeds from the assumption that unfettered ownership of space resources in perpetuity should be recognized for private entities, that is, "private appropriation."[7] No cogent argument has yet been advanced, however, to establish the authority of states to license private entities to appropriate extraterrestrial areas or resources when such activities clearly are prohibited to the states themselves.[8] Thus, both the focus and the underlying assumption may be misplaced.

Unfettered ownership of space resources may be convenient and potentially profitable, however, the necessity for such "property rights" has not been satisfactorily demonstrated. Such unrestricted ownership does not exist for real property on Earth, which is subject to a host of rules and regulations. Even the exercise of exclusive ownership rights for intellectual property, which is wholly created by the author or inventor, are limited in time. It is significant that the Moon Treaty permits the use of resources and other materials by scientific investigations, in quantities appropriate for the support of the mission, without sole and exclusive ownership or claim of appropriation of the surface or subsurface. It further is significant that the prohibition of appropriation in the Moon Treaty applies to resources "in place."[9]

Treaty is not necessarily restricted to the non-appropriation doctrine.

7. White, *supra* note 5, at 371-74.

8. *See* C.W. JENKS, SPACE LAW 201 (1965); van Traa-Engelman, *Clearness Regarding Property Rights on the Moon and Other Celestial Bodies*, PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 38, 42 (1997).

9. Moon Treaty, *supra* note 1, at arts. 6.2, 11.3; Gal, *Acquisition of Property in the Legal Regimes of Celestial Bodies* PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 45, 47 (1997); Galloway, *supra* note 2, at 21.

It is beyond question that the Outer Space Treaty was not intended to provide a comprehensive framework to regulate the activities of private entities in space. However, it also is clear that the Outer Space Treaty expressly recognizes that the private sector has the right to conduct activities in space, subject to authorization and continuing supervision by the appropriate responsible state.[10] Moreover, and of equal if not greater importance, the Outer Space Treaty has been instrumental in preserving space and celestial bodies for peaceful purposes only. The maintenance of outer space for peaceful purposes has fostered an environment where activities by both the public and the private sectors can be conducted, and without the necessity of fortifications or militarily defensive armaments.[11] Furthermore, the provisions of the Moon Treaty should not be completely disregarded just because it has received limited acceptance. The absence of ratification by a state does not equate to a grant of *carte blanche* authority for its citizens to engage in activities prohibited by the Moon Treaty. Many of the provisions of the Moon Treaty are found in other international instruments which have received widespread acceptance, including but not limited to the Outer Space Treaty.[12] The expansion of

---

10. Outer Space Treaty, *supra* note 4, at art. VI. For a discussion of the designation of the "appropriate" state, see von der Dunk, *Liability versus Responsibility in Space Law: Misconception or Misconstruction?*, PROCEEDINGS OF THE 34TH COLLOQUIUM ON THE LAW OF OUTER SPACE 363 (1992).

11. Mrs. Galloway eloquently observed during discussions at the 40th Colloquium in Turin that these are *tangible benefits* from space activities which inure to the entire world.

12. Cocca, *Property Rights on the Moon and Celestial Bodies*, PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 9 (1997)(even in the absence of the common heritage of mankind provision of the Moon Treaty, the interests and needs of developing countries, and the rights of those conducting commercial activities using space resources, are to be taken into account, consistent with article 55(a) of the United Nations Charter, at 10-11).

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

commercial enterprises from industrialized states, in the absence of any effective international regulation, may give new impetus for the developing world to reconsider and re-evaluate the desirability of ratifying the Moon Treaty.

Critics of the space treaties, and proponents of specific projects, would be naive to assume that the international community will abandon its role in the legal regulation of space. There is no area of human commercial endeavor which is not subject to legal regulation, and no convincing reason has been presented as to why the commercialization of space should not be subject to the rule of law.[13] Whatever the merits of a particular project, it is doubtful that the Outer Space Treaty will suddenly cease to exist, or that the non-appropriation doctrine will be deemed to be inapplicable to commercial exploitation. Indeed, it has been demonstrated that the abrogation of the non-appropriation doctrine may have the opposite effect than that which is desired by its critics, and that the resulting circumstances would be even less favorable for the private sector than is perceived to exist today with the Outer Space Treaty.[14]

The legal regime to be developed must be neutral both in the sense of potentially competing specific programs, as well as in the context as arbiter of the rights and responsibilities to be regulated, enforced and protected. This neutrality is essential if the regulatory structure is to gain acceptance by the community of nations, and it is only from such universal acceptance that the regime can derive any legitimate authority. The regulatory environment, therefore, must be developed without regard to promoting or furthering any particular commercial venture or purpose.

It is submitted that no one model of regulation will be appropriate or effective when applied to all venues, such as celestial bodies, the surface, subsurface or portions thereof, or the projects which may be conducted by a variety of *ens*. That is, what may be appropriate for the Moon may not be adequate for Mars, or its moons Deimos and Phobos, or the asteroids, or the Apollo-Amour class asteroids, *et cetera*.[15] Each of these bodies has unique attributes, environments, and histories. Who can deny that the Moon holds a special place in every culture on Earth, and is part of the shared experience of mankind, in other words, part of the *common heritage of mankind*. In this regard, it can be questioned whether the rights of mankind can be adequately protected in international law.[16] Nevertheless, it is clear that the legal structure to govern the use of space resources must be substantively flexible to ensure that the appropriate policies will be respected, even when applied to different, new and unforeseen projects and programs. The inquiry, therefore, must focus on the identification of the appropriate policies to be served by an international legal regime.

POLICIES AND PURPOSES OF INTERNATIONAL REGULATION

The Outer Space Treaty provides that activities in space are to be conducted for peaceful purposes, and in conformity with international law.[17] The Outer Space Treaty further provides, in article I, that the exploration and use of outer space, including the Moon and other celestial bodies, shall be the province of all mankind. The Moon Treaty, on the other hand, declares the Moon and its resources to be the

13. *See* de Seife, *Star Wars or Star Peace: The Impact of International Treaties on the Commercial Uses of Space*, in 1 AMERICAN ENTERPRISE, THE LAW AND THE COMMERCIAL USES OF SPACE 73, 97 (1986).

14. Sterns, Stine & Tennen, *Preliminary Jurisprudential Observations Concerning Property Rights on the Moon and Other Celestial Bodies in the Commercial Space Age*, PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 50 (1997).

15. Jenks, *supra* note 8, at 201; for a discussion of the definition of celestial bodies, see Fasan, *Asteroids and Other Celestial Bodies - Some Legal Differences*, 26 J. SPACE L. 33 (1998).

16. Gal, *supra* note 9, at 48.

17. Outer Space Treaty, *supra* note 4, at arts. III, IV.

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

common heritage of mankind, subject to an international regime which states parties undertake to establish. The province of mankind principle does not impose a specific treaty requirement on how benefits are to be shared,[18] and in accordance with the Outer Space Treaty, the activities of private entities are authorized and regulated only by the appropriate responsible state.[19] The common heritage of mankind, however, will impose regulation by the community of states party to the Moon Treaty through the international regime.[20]

Article 11(7) of the Moon Treaty provides that the specific purposes to be served by the international regime are as follows:

> (a) The orderly and safe development of the natural resources of the moon;
>
> (b) The rational management of those resources;
>
> (c) The expansion of opportunities in the use of those resources; and
>
> (d) An equitable sharing by all States Parties in the benefits derived from those resources, whereby the interests and needs of the developing countries which have contributed either directly or indirectly to the exploration of the moon, shall be given special consideration.

The first three purposes identified above do not appear to be either unreasonable or controversial. The benefits to orderly and safe development, rational management, and expansion of opportunities in the use of space resources, as general propositions, are readily apparent, and likely will be among the purposes of any legal regulatory regime. However, the requirement for the "equitable sharing of benefits" is the subject of considerable disagreement, both as to content as well as advisability for international policy.[21]

The Moon Treaty does not purport to identify all of the purposes to be served by the international regime in the regulation of the use of lunar resources. Moreover, the international regime of the Moon Treaty is limited in applicability to the exploitation of natural lunar resources.[22] Additional purposes which must be met by a legal regime, especially for the broader commercial development of space, include a means for the registration of claims, to establish priorities, to adjudicate disputes, and to provide appropriate notice to and among entities

---

18. Galloway, *supra* note 2, at 22.

19. Outer Space Treaty, *supra* note 4, at art. VI.

20. *See* Correspondence from F. von der Dunk to authors, June 25, 1998, copy on file in the Law Offices of Sterns and Tennen [hereinafter referred to as "von der Dunk, Correspondence"].

21. *See generally* Cocca, *Property Rights, supra* note 15; Cocca, *The Common Heritage of Mankind: Doctrine and Principles of Space Law - An Overview*, PROCEEDINGS OF THE 29TH COLLOQUIUM ON THE LAW OF OUTER SPACE 17 (1987); Doyle, *Legal and Policy Implications of Treating Natural Resources as the Common Heritage of Mankind in Outer Space Law*, PROCEEDINGS OF THE 29TH COLLOQUIUM ON THE LAW OF OUTER SPACE 31 (1987); Galloway, *Political Philosophy and the Common Heritage of Mankind Concept in International Law*, PROCEEDINGS OF THE 23RD COLLOQUIUM ON THE LAW OF OUTER SPACE 25 (1981); Jasentuliyana, *Balancing the Conflicting Demands in Legislating Common Property Resources of the Ocean and Space*, PROCEEDINGS OF THE 28TH COLLOQUIUM ON THE LAW OF OUTER SPACE 147 (1986); Sterns & Tennen, *Utilization of Extraterrestrial Resources: Law, Science and Policy*, PROCEEDINGS OF THE 35TH COLLOQUIUM ON THE LAW OF OUTER SPACE 499 (1993); Williams, *The Common Heritage of Mankind and the Moon Agreement - Economic Implications and Institutional Arrangements*, PROCEEDINGS OF THE 24TH COLLOQUIUM ON THE LAW OF OUTER SPACE 87 (1982).

22. Kopal, *Outer Space as a Global Commons*, PROCEEDINGS OF THE 40TH COLLOQUIUM ON THE LAW OF OUTER SPACE 108, 115 (1998).

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

conducting activities.[23] Prof. Wassenbergh would add:

> -- ensure licensing and authorization of private entities
>
> -- recognition of civil space objects and spacecraft
>
> -- give traffic 'rules of outer space'
>
> -- ensure security of space activities
>
> -- provide the needed infrastructure
>
> -- guaranty fair competition internationally
>
> -- arrange for standardization of licensing and registration, and
>
> -- protection of the environment[24]

Amb. Cocca has endorsed the description of policies articulated by Szalóky, including:

> -- assure exploration and use will serve common interests of mankind
>
> -- contribute to development of science
>
> -- development of economical and social circumstances of present and future generations
>
> -- improvement of mutual understanding, and
>
> -- strengthening amicable connections between states and peoples[25]

The policies and purposes identified above encompass a broad range of issues applicable to the commercial development of space, but do not, in and of themselves, include the legal regime itself making a profit. Within each category are elements deserving of analysis and discussion in an unbiased and objective manner by a variety of disciplines, including scientists, engineers, lawyers and management experts.[26] The most contentious issues, however, may relate to the sharing of benefits.

Dr. von der Dunk has argued that the textual context of the Moon Treaty indicates that the requirement for the sharing of benefits does not apply to all the nations of the world, but rather is limited to the subset of those states which have become party to that instrument, and that the treaty imposes a moratorium on the use of lunar resources pending the establishment of an international regime.[27] Prof. Wassenbergh agrees

---

23. *See* Sterns, Stine & Tennen, *supra* note 14, at 56.

24. Wassenbergh, *The International Regulation of an Equitable Utilization of Natural Outer Space Resources*, PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 138, 140 (1997).

25. Cocca, *supra* note 12, at 11, n. 12, *citing* Szalóky, *The Way of the Further Perfection of the Legal Regulation Concerning the Moon and Other Celestial Bodies, Especially Regarding the Exploitation of Natural Resources of the Moon and Other Celestial Bodies*, PROCEEDINGS OF THE 16TH COLLOQUIUM ON THE LAW OF OUTER SPACE 196, 198 (1974).

26. *See* Galloway, *supra* note 2, at 22.

27. von der Dunk, *The Dark Side of the Moon - The Status of the Moon: Public Concepts, Private Enterprise*, PROCEEDINGS OF THE 40TH COLLOQUIUM ON THE LAW OF OUTER SPACE 119, 121 (1998)[hereinafter referred to as "von der Dunk, Dark Side of the Moon"]("even an accepted basis for [an international] regime is absent . . . any applicability of the [common heritage of mankind] principle to the moon is . . . not even equivocally established by the Moon Agreement itself" at 122A); *see also* von der Dunk, Correspondence, *supra* note 20; Wassenbergh, *supra* note 24, at 138; *but see* Galloway, *supra* note 2, at 22 (*quoting* Hosenball).

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

that the Moon Treaty imposes a moratorium, and has suggested that the most appropriate method for benefits to be shared would be through a form of "cross-border cooperative arrangements."[28] White is of the opinion that the sharing of benefits would be satisfied merely by the advanced states making obsolete facilities in space available for purchase by non-launching states.[29]

Fasan has framed the issue in terms of sharing of resources rather than benefits. In Fasan's view, the right of present use should be clearly permitted, while exclusion for later access and use clearly prohibited.[30] Additional concerns regarding the sharing of benefits relate to the availability of information, both scientific and technical.[31] O'Donnell has asserted that the sharing of benefits is a *treaty burden* which must be endured, and has offered a formula for dedicating and transferring 50% of resources to a legal authority for "public benefit sharing property."[32] Cramer has brushed aside the common heritage of mankind provision and failed to give it any consideration in the development of a proposal to govern the commercial use of the Moon.[33] An effective and appropriate international legal regime will not be established in the absence of consensus on these issues. At the present time, the only element on which there appears to be general agreement is that the rights of private entities must be considered.[34]

The absence of an international legal regime may impede, but will not prevent, the movement of the private sector into space. This does not mean, however, that private enterprise will operate in a legal vacuum, as national legislation will continue to be used to authorize the licensing of commercial entities to conduct activities in space, subject to extant international law.[35] Nevertheless, the "combinations of incongruous and contradictory results [of nation by nation regulation] may be very large."[36] Clearly, a comprehensive international juridical regime would be preferable, and better serve the interests of the private sector, and mankind in general, and preserve space for peaceful purposes, than a patchwork of independent and unreconciled national legislation.[37]

Elaborate proposals have been presented which are designed to grant, regulate, enforce, protect and or create markets in space resources. Some of these proposals urge the extension of terrestrial property laws to space facilities,[38] while others envision a modification of basic principles

---

28. Wassenbergh, *supra* note 24, at 140.

29. White, *supra* note 5, at 371.

30. Fasan, *Dominum Lunae, Proprietas Lunae*, PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 1, 6 (1997).

31. See text & notes 50-51, *infra*.

32. O'Donnell, *Benefit Sharing: The Municipal Model*, PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 151, 156 (1997) *reprinted in* 5 SPACE GOVERNANCE 66, 69 (1998)(derived from the "municipal model" of Castle Rock, Colorado). Even assuming a 50% set aside is reasonable, such would not end the "municipal model," as ongoing local property taxes may continue to be assessed against the property on a periodic basis.

33. Cramer, *The Lunar Users Union - An Organization to Grant Land Use Rights on the Moon in Accordance with the Outer Space Treaty*, PROCEEDINGS OF THE 40TH COLLOQUIUM ON THE LAW OF OUTER SPACE 352, 353 (1998)(asserting that countries not engaged in lunar activity have no reason to be involved in the regulatory body).

34. van Traa-Engelman, *supra* note 8, at 42; see text & notes 53-59, *infra*.

35. von der Dunk, Dark Side of the Moon, *supra* note 27, at 120.

36. O'Donnell, *supra* note 32, at 153; *see also* von der Dunk, Dark Side of the Moon, *supra* note 27, at 122A (arguing that national legislation can apply only to space objects).

37. *See* von der Dunk, Dark Side of the Moon, *supra* note 27, at 120.

38. White, *supra* note 5, at 379.

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

of property law when applied to non-terrestrial venues.[39] Still others create various bureaucratic institutions in lieu of or as an alternative to the international regime of the Moon Treaty.[40] However, the practice of states in the application of the common heritage of mankind may provide guidance as to the manner in which the legal regulation of space resources can be developed.

JURIDICAL REGIMES AND THE COMMON HERITAGE OF MANKIND

The first use of lunar materials occurred in the late 1960's, when both the United States and the Soviet Union returned rocks and other samples by manned and robotic missions. Although these activities occurred prior to the Moon Treaty, Gal has noted that there was no objection to the "ownership" of the materials by the state which collected them.[41] Of course, it would be difficult for anyone to seriously question the right of the state which collected these first samples to retain and examine them, and there was some distribution of the materials. This limited base of experience, however, would not be sufficient to give rise to a generally accepted custom. Moreover, the Moon Treaty recognizes the right of states to collect and remove samples from the surface and subsurface, and to utilize such materials for scientific purposes in support of the mission. The Moon Treaty further provides, however, that states "shall have regard to the desirability of making a portion of such samples available to other interested States Parties and the international scientific community for scientific investigation."[42]

The use of limited frequency spectrum and orbital slots exemplify issues presented by the use of space resources. In recent years, states have found a previously untapped source of revenue by auctioning frequency spectrum and charging fees for orbital slots. Ospina has observed that these auctions and fees may tend to give rise to expectations of property rights in such intangible resources. She notes that states, both large and small, could view other elements for use by the private sector, such as shipping lanes, air lanes, *et cetera*, as appropriate subjects for auctions or other revenue generating activities. The continuation of these practices, according to Ospina, could lead to the concentration of resources in "mega" corporations, which would be contrary to the current focus emphasizing "market forces."[43] Almond agrees with this conclusion, and argues that the beneficiaries will be corporations of developed countries, not the developing countries.[44] Such a result, of course, would be counterproductive in relation to the apparent policies and purposes of the common heritage of mankind principle.

Kosuge also has questioned the practice of auctions of space resources, stating "[o]ver the counter and lottery allocations provide windfall gains to those lucky enough to be allocated scarce licenses, at the cost of the community as a whole. There is, moreover, no guarantee that the most valued and efficient uses will be accommodated."[45] However, Kosuge seems to favor auctions if market forces can be introduced into spectrum management. As an example, he points to auctions of "spectrum licenses" in

---

39. Oosterlink, *Tangible Property in Outer Space*, PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 271 (1997).

40. See text & notes 60-66, *infra*.

41. Gal, *supra* note 9, at 45.

42. Moon Treaty, *supra* note 1, at art. 6.

43. Ospina, *The Privatisation of the 'Province of Mankind' Time to Reassess Basic Principles of Space Law*, PROCEEDINGS OF THE 40TH COLLOQUIUM ON THE LAW OF OUTER SPACE 89, 91-93 (1998); *see also* Pritchard, "Auctioning Spectrum - A Bad Idea," 33 *Aerospace America* 3 (Nov. 1995).

44. Almond, *The Legal Status of Property on the Moon and Other Celestial Bodies*, PROCEEDINGS OF THE 39TH COLLOQUIUM ON THE LAW OF OUTER SPACE 20, 25 (1997).

45. Kosuge, *Commercialization of Space Activities and Applications of the Space Treaty . . . Geostationary Orbit and Frequency Spectrum*, PROCEEDINGS OF THE 40TH COLLOQUIUM ON THE LAW OF OUTER SPACE 330, 333 (1998).

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

Australia, where the government does not dictate the *use*, and the license is fully tradable.[46]

International Regulation of Ocean Resources

The emphasis on market forces may be a key to future regulation of resources *vis-a-vis* the common heritage of mankind. The concept of the common heritage of mankind is not unique to the *corpus juris spatialis*, but also is expressly set forth in the Law of the Sea Convention.[47] The LOS Convention met with significant opposition and limited acceptance by the industrialized world, largely as a result of the restrictions on commercial development of ocean resources, which are subject to an International Seabed Authority (ISA). However, in 1994, a significant amendment to the LOS Convention was adopted,[48] which substantially revised the ISA, and introduced market forces into the regulation of ocean resources. As a result of this amendment, the LOS Convention has garnered renewed support with both the industrialized and the developing nations.[49]

The 1994 Agreement restructured the ISA to give the industrialized nations influence commensurate with their interests. Although not specifically mentioned by name, the 1994 Agreement is constituted such that the United States is made a permanent member of both the governing Council and Assembly. The Council, moreover, is composed of representatives of the major consumers of minerals, the largest investors in deep seabed mining, the major land-based producers of minerals, the developing countries, and an overall equitable geographic distribution of states. Decisions of the Council generally require a majority of each of these constituent groups. However, consensus is required to enact any measure for the sharing of benefits, *i.e.*, revenues. Substantive decisions of the Assembly can only be taken contemporaneous with, or on recommendation of, the Council or subsidiary finance committee. In the event the Assembly rejects such a recommendation, the matter is remanded to the Council for further consideration.[50]

Additional provisions of the 1994 Agreement stipulate that the principle of cost effectiveness shall govern all organs and subsidiary bodies, which should have the effect of maintaining a small bureaucratic structure. In addition, the establishment and functioning of the ISA are to be based on an evolutionary approach, taking into account the functional needs of the organs and bodies concerned. The 1994 Agreement deleted any mandatory technology transfer in the development of ocean resources, opting, rather, for a set of general principles. Significantly, the 1994 Agreement terminated

---

46. *Id.* at 334.

47. Convention on the Law of the Sea, part XI, art. 136, *opened for signature* Dec. 10, 1982, U.N. Doc. A/CONF.62/122 (1982), *reprinted in* UNITED NATIONS, OFFICIAL TEXT OF THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA WITH ANNEXES AND INDEX, U.N. Sales No. E.83.V.5 (1983)[hereinafter referred to as the "LOS Convention"]. This provision of the LOS Convention has been considered to be closely analogous to the common heritage provision of the Moon Treaty. *See generally* Jasentuliyana, *Balancing the Conflicting Demands in Legislating Common Property Resources of the Ocean and Space*, PROCEEDINGS OF THE 28TH COLLOQUIUM ON THE LAW OF OUTER SPACE 147 (1986); Kopal, *Analogies and Differences in the Development of the Law of the Sea and the Law of Outer Space*, PROCEEDINGS OF THE 28TH COLLOQUIUM ON THE LAW OF OUTER SPACE 151 (1986).

48. G.A. Res. 48/263 (July 28, 1994)[hereinafter referred to as the "1994 Agreement"].

49. *See generally*, Dept. of State, Council on Ocean Law, U.S. Commentary on the LOS Convention Including the 1994 Amendments, http://lcweb2.loc.gov/law/GLINV1/GLIN.html; Browne, *Congressional Research Service Issue Brief for Congress*, (June 6, 1997), *text available through* Committee for National Institute for the Environment, www.cnie.org/nle/leg-9.html.

50. 1994 Agreement, *supra* note 48, at § 3 Annex.

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

production limits of sea based mining, and modified the Enterprise to become operational only on the decision of the Council. Moreover, once initiated, the Enterprise will not be accorded special privileges, but will be subject to the same obligations as other miners.[51]

The application of the 1994 Agreement to the common heritage of mankind principle is more of an *equality of opportunity* rather than the forced sharing of revenues or other form of tribute or taxation. The United States' position is that "the Agreement, by restructuring the seabed mining regime along free market lines, endorses the consistent view of the United States that the common heritage principle fully comports with private economic activity in accordance with market principles"[52]

Regulation of International Trade

The application of market principles is largely dependent upon an effective and predictable mechanism for the resolution of disputes. In 1994, the dispute resolution process of the World Trade Organization was substantially revised,[53] to "reflect a fundamental shift in the nature of international trade dispute settlement from a political, consensus-based process to a more legalistic system."[54] The procedures for resolution of international trade disputes may provide a model for extension to extraterrestrial commercial issues. The WTO process emphasizes prompt determinations by impartial panels, with the assistance, when desired, of technical experts. Panel decisions are to be issued no more than 14 months after a party initiates the dispute resolution process.[55] A review procedure is available, but only in regard to errors of law.[56]

The Dispute Settlement Understanding significantly altered the requirements to prevent implementation of a panel decision. Specifically, individual countries will no longer be able to block implementation of a report. Rather, panel or appellate decisions automatically will be adopted unless rejected by consensus.[57] Where a violation is found to exist, the offending party must either comply with its obligations or engage in discussions for compensation. If these

---

51. For discussions of the 1994 Agreement, *see generally* Charney, *U.S. Provisional Application of the 1994 Seabed Agreement*, 88 AM. J. INT. L. 705 (1994); Sohn, *International Law Implications of the 1994 Agreement*, 88 AM. J. INT. L. 696 (1994); Oxman, *The 1994 Agreement and the Convention*, 88 AM. J. INT. L. 687 (1994).

52. U.S. Senate, 103rd Cong., 2nd Sess., UNITED NATIONS CONVENTION ON THE LAW OF THE SEA, WITH ANNEXES, AND THE AGREEMENT RELATING TO THE IMPLEMENTATION OF PART XI OF THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA, WITH ANNEX, Treaty Document 103-39, at 61 (1994).

53. Uruguay Round's Understanding on Rules and Procedures Governing the Settlement of Disputes, *text reproduced in* GATT, The Results of the Uruguay Round of Multilateral Trade Negotiations: The Legal Texts (1994); *see also* Final Act Embodying the Results of the Uruguay Round of Multilateral Negotiations, *opened for signature* April 15, 1994, *in Uruguay Round of Multilateral Trade Negotiations: Legal Instruments Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations done at Marrakesh on April 15, 1994* (1994), 33 I.L.M. 1143 (1994)[hereinafter referred to as "Dispute Settlement Understanding"].

54. American Bar Association, Section of International Law and Practice, *The World Trade Organization The Multilateral Trade Framework for the 21st Century and U.S. Implementing Legislation* 585 (T.P. Stewart, ed. 1996)[hereinafter referred to as "Stewart"]; *see also* Moon Treaty, *supra* note 1, at art. 4.2.

55. Dispute Settlement Understanding, *supra* note 53, at art. 4.

56. Stewart, *supra* note 56, at 585-86; *see also* Palmeter & Mavroidis, *The WTO Legal System: Sources of Law*, 92 AM. J. INT. L. 398 (1998).

57. Dispute Settlement Understanding, *supra* note 54, at arts. 16.4, 17.14.

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

discussions fail to achieve a prompt resolution of the matter, the aggrieved party can request the right to retaliate. Retaliation, in the form of tariffs or other import restrictions, may be broad in scope, can continue indefinitely, and need not be restricted to the same market segment from which the dispute arose. Nevertheless, cross-retaliation must be "equivalent," and is subject to limited review. Significantly, however, the party found in violation can reject the panel decision, and accept retaliation or negotiate compensation.[58]

It must be noted that although the purposes of the WTO specifically extend to international trade by the private sector, membership in the organization is granted to states. Individual complaints are brought by states on behalf of their citizens and corporations. Nevertheless, the procedures of the WTO are designed to protect the rights of these private parties.

International Cooperation and the Sharing of Benefits

The issue of the utilization of space resources was addressed by the General Assembly in the *Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries.*[59] This Declaration draws substantially from both the Outer Space Treaty and the Moon Treaty, and expressly refers to the province of all mankind. The focus is on the promotion and fostering of international cooperation on an equitable and mutually acceptable basis. Contractual terms in cooperative ventures should be fair and reasonable, and particular attention should be given to the benefit and the interests of developing countries. Finally, cooperation should be conducted in the modes that are considered most effective and appropriate by the countries concerned.

The basic policies to be served by this cooperation are described as follows:

> (a) Promoting the development of space science and technology and of its applications;
>
> (b) Fostering the development of relevant and appropriate space capabilities in interested States; and
>
> (c) Facilitating the exchange of expertise and technology among States on a mutually acceptable basis.

This description of policies is similar and complimentary to the formulation of policies expressed in the Moon Treaty for the international regime. The principles appear to provide a means for the equitable sharing of benefits in conformity with market principles, and consistent with the *corpus juris spatialis.*

The Lunar Economic Development Authority

Perhaps the most ambitious proposal for the regulation of commercial use of space resources has been made by the United Societies in Space, which has called for the establishment of a Lunar Development Economic Authority (LEDA). The LEDA is part of a larger plan, which includes the creation of a new political entity termed "Metanation." The LEDA, either alone or in conjunction with other proposed elements, is not intended to be an impartial regulator of the use of extraterrestrial resources, but will fund projects, and create, control and operate the developmental infrastructure. Thus, the LEDA, as proposed, will authorize and regulate, as well as provide services to and compete with, private commercial ventures.

According to O'Donnell and Harris, the purposes of the LEDA are to:

> -- issue bonds to underwrite lunar enterprises
>
> -- provide site planning and permits

---

58. Stewart, *supra* note 54, at 589.

59. G.A. Res. 51/122 (December 13, 1996), *text reprinted in* UNITED NATIONS TREATIES AND PRINCIPLES ON OUTER SPACE 54 (1997), http://www.un.or.at/OOSA/ga/ga51_122.html.

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

> -- lease lunar surface, facility and equipment rights
>
> -- coordinate and facilitate international endeavors on or near the Moon
>
> -- offer zoning and inspection services
>
> -- supply administration and policing of lunar settlements; and
>
> -- conduct public information and development programs to encourage investment in lunar resource utilization.[60]

The articulated purposes of LEDA incorporate the policies expressed in article 11.7(a - c) of the Moon Treaty for the international regime relating to the orderly and safe development, rational management, and the expansion of opportunities in the use of lunar resources, although stated in different terms. When taken in conjunction with the proposed "municipal model" of a 50% set aside of resources for "public benefit sharing property,"[61] it appears that the LEDA also has attempted to satisfy the fourth element expressed in the Moon Treaty, that of sharing of benefits. However, the LEDA is not intended to constitute the international regime of the Moon Treaty, nor is the authority of LEDA restricted to the use of lunar resources. Rather, the LEDA seeks to exercise complete control over the use and exploitation of the resources of space. In the words of one proponent:

> The existing treaty regime is inherently and necessarily flawed in today's and tomorrow's environment and needs to be replaced by an independent sovereign ***metanation with jurisdiction over the venue known as space*** and as presented by commentators such as United Societies In Space, Inc. under a U.N., [sic] Trusteeship (emphasis added).[62]

The LEDA, therefore, seeks to substitute private sector management for public regulation of the use of space and its resources. Significantly, the LEDA fails to include the community of nations in any participatory role in the regulatory structure, not even as members of a "non-voting consortia advisory board."[63] Ospina questions whether corporations are prepared to accept liability and take full responsibility for their endeavors, noting that corporations are motivated by profit, and are largely uncontrollable by the general population. Governments, however, are accountable to the public.[64]

The LEDA proposal presents several additional concerns. First, the monopoly of control inherently is susceptible to abuse. LEDA combines both legislative as well as police enforcement powers, but lacks adequate institutional restraints against arbitrary or capricious action. Further, there is no procedure for international consultations nor international review.[65] Moreover, the LEDA incorporates attributes which were rejected by the 1994 Agreement concerning the LOS Convention, such as unfair competition of the regulatory body with private enterprise, and a large, rigid bureaucratic structure. The proposal to set aside 50% of resources is questionable as a blanket policy, as it fails to account for specific circumstances of the resources to be used, such as the location, relative

---

60. O'Donnell & Harris, "Renewing the Industry Through Lunar Development," 34 *Aerospace America* 22 (Sept. 1996).

61. O'Donnell, *supra* note 32.

62. Quiat, *supra* note 6, at 183.

63. *See* O'Donnell, *supra* note 32, at 159.

64. Ospina, *supra* note 43, at 92-93.

65. *Cf.* Outer Space Treaty, *supra* note 4, at art. IX; Moon Treaty, *supra* note 1, at art. 15.2; Convention on International Liability for Damages Caused by Space Objects, *opened for signature* March 29, 1972, art. IX, 24 U.S.T. 2389, T.I.A.S. No. 7762, 961 U.N.T.S. 187, *text reproduced in* UNITED NATIONS TREATIES AND PRINCIPLES ON OUTER SPACE 14 (1997).

This article from International Institute of Space Law is published by Eleven international publishing and made available to anonieme bezoeker

scarcity or abundance, potential uses and other relevant factors.[66] Finally, the LEDA gives insufficient consideration to international cooperation, equality of opportunity, and market principles, all of which have played an important role recently in providing substance to the common heritage of mankind principle.

CONCLUSION

The common heritage of mankind principle has been the subject of substantial debate, and considerable confusion and misunderstanding. The concept of "sharing of benefits" often has been criticized as a mechanism to force the division of revenues or impose other "treaty burdens" on private enterprise in the commercial development of space. Historical experience and recent developments, however, demonstrate that the common heritage of mankind does not present an inherently unreasonable burden to the use of the resources of space, but rather can promote the continued peaceful utilization of space.

The 1994 Agreement concerning the LOS Convention, together with the Dispute Settlement Understanding of the WTO, and the recent General Assembly resolution concerning the use of space resources, provide substance to the application of the common heritage of mankind principle. It is recommended that the provisions of these instruments be considered as providing a potential foundation for the international legal regulation of commercial space activities. Specifically, emphasis should be placed on market principles, as well as legal process and procedures. A flexible and evolutionary approach should be adopted, and measures taken to limit the bureaucratic structure. In addition, international cooperation must be promoted, and equality of opportunity preserved. Nevertheless, appropriate representation of states must be provided commensurate with their interests. Finally, the juridical regime must be a neutral arbiter, and not engage in unfair competition with private entities subject to its regulatory authority.

---

66. *See* Pritchard, *supra* note 43.