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The United States extended to outer space its proven basic philosophy of private and corporate ownership of the means of production and distribution with the enactment and implementation of the Communication Satellite Act of 1962,<sup>1</sup> which gave birth to COMSAT—a private corporation “created . . . for profit.”<sup>2</sup> The corporation is authorized to create and, either by itself or in conjunction with foreign governments or business entities, operate “a commercial communications satellite system.”<sup>3</sup>

The U.S. Civil Space Policy, announced on October 11, 1978,<sup>4</sup> and various legislative proposals introduced during the 96th Congress<sup>5</sup> reflect contemplation of increased participation of private enterprise in space endeavors. The President’s announcement further stated that the Policy was to “confirm our support of the continued development of a legal regime in space that will assure its safe and peaceful use for the benefit of mankind.”<sup>6</sup>

Earlier, in June 1978, the President established a Space Policy Review Committee within the Executive Office of the President, under the chairmanship of the Director of the Office of Science and Technology, with the assigned objective, among others, of: “. . . the encouragement of domestic commercial exploitation of space capabilities and systems for economic benefit and to promote the technological position of the United States.”<sup>7</sup>

A more recent White House Press Release of November 20, 1979 announced assignment by the President of responsibility for planning and development of a civil *operational* land remote sensing activity to the National Oceanic and Atmospheric

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<sup>1</sup>Pub. L. No. 87-624, 76 Stat. 419, 47 U.S.C. 701, et. seq. (1962).

<sup>2</sup>*Id.* § 301.

<sup>3</sup>*Id.* § 305(a) (1).

<sup>4</sup>*White House Fact Sheet*, Oct. 11, 1978, “U.S. Civil Space Policy,” republished in Sen. Doc., 95th Cong., Comm. Print of Senate Comm. on Commerce, Science and Transportation “Space Law—Selected Basic Documents” (2d Ed.) 561-564 (1978).

<sup>5</sup>See S. 212, 96th Cong., “The National Space and Aeronautical Policy Act of 1979”; S. 244, 96th Cong., “Space Flight Policy Act of 1979”; S. 663, 96th Cong., “Earth Data and Information Service Act of 1979”; S. 875, 96th Cong., “Earth Resources Information Corporation Act of 1979” and H. R. 2337, 96th Cong., “Space Industrialization Act of 1979.”

<sup>6</sup>U.S. Civil Space Policy, *supra* note 4, at 561.

<sup>7</sup>White House Press Release, June 20, 1978, Presidential Directive on National Policy, republished in S. Doc. 95th Cong. “Space Law—Selected Basic Documents,” *supra* note 4, at 559.

Administration (NOAA) of the Department of Commerce. NOAA is to seek private sector and international involvement in its planning with the view of eventual private sector ownership and management of the United States' civil operational land remote sensing activities.<sup>8</sup>

It is not this author's intent to detail the many future activities in space deemed feasible by scientific or technical advances; however, a brief, broad summary is necessary as a basis for discussion of space law implications. Of all activities in outer space, communication is and will continue in the near future to be the most advanced, in terms of commercial return on investment. New operational capabilities now are foreseen, particularly with the new transportation systems—such as the Space Shuttle<sup>9</sup> and ESA's Ariane. The latter has already made a successful initial developmental flight; operational use is foreseen as early as 1982.<sup>10</sup>

John H. Disher, NASA's former Director of Advanced Programs, Office of Space Transportation Systems, foresees that revenues "from commercial operations in space over the next 25 years will grow to tens of billions of dollars per year. . . ."<sup>11</sup>

The opening statement of Ambassador Peter Jankowitsch, Chairman of the U.N. Committee on the Peaceful Uses of Outer Space (COPUOS), at the Committee's 1979 session at the U.N. contains an excellent concise recital apropos to future space endeavors:

We are now seriously considering daily flights to orbit which might serve and supply large technical facilities such as research laboratories, astronomical laboratories, earth resources observatories, manufacturing facilities or communication centres. We are also considering expanding direct-to-home television broadcasting throughout the world; and erecting large structures in space, stabilizing them and moving them about. The possible early demonstration of a large structure that could be part of a large solar experiment is under active consideration. And, finally, we are examining the possibility

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<sup>8</sup>The Nov. 20, 1979 Presidential action was premised upon an Interagency Task Force study, "Private Sector Involvement in Civil Remote Sensing," dated June 15, 1979. A future system of apparent interest to the private sector participants is the development of a complementary "Stereosat" system to produce third-dimensional images.

<sup>9</sup>Glazer, 17 Colum. J. Transnat'l L. 67, 97 (1978). Mr. Glazer, General Counsel of NASA Ames Research Center, has observed that ownership and control of U.S. registered space transportation systems might well pass to the private sector as advanced shuttle systems start to provide general carriage of goods and persons between terrestrial and Earth-orbiting sites.

<sup>10</sup>"International Implications of New Space Transportation Systems," U.N. Doc. A/AC. 105/244 at 7, 10 (1979). Currently, NASA advises that due to an engine problem, Ariane operational status will be delayed until early 1982.

<sup>11</sup>Disher, "Space Transportation, Satellite Services and Space Platforms," 17 *Astronautics and Aeronautics* 42, 67 (1979).

of setting up large, earth-like communities several hundred thousand miles up in space.<sup>12</sup>

Mr. Arthur Goldberg, our then Ambassador and U.S. Representative at the United Nations, speaking on the floor of the General Assembly on December 17, 1966, stated, "As man steps into the void of outer space, he will depend for his survival not only on his amazing technology, but also on this other gift which is no less precious: The rule of law among nations."<sup>13</sup>

The foundation for the legal framework for commercial participation in space activities is set forth in our initial U.N. sponsored 1967 Outer Space Treaty.<sup>14</sup> Many countries were interested in the signing of the Treaty as their territory was subject to over-flights of the orbiting satellites and the treaty addressed their natural concern for their security and safety as well as their desire to share in this new, great adventure.

In this author's 1959 thesis on "Astronautical Law," a principal recommendation was that the United States should ". . . within the United Nations invite all member nations to jointly (1) disclaim rights of sovereignty over celestial bodies and (2) agree that sovereignty over celestial bodies will be exercised as the U.N. General Assembly may determine."<sup>15</sup>

I was naturally delighted when President Eisenhower, in an address to the U.N. General Assembly on September 22, 1960, specifically proposed adoption of the principle that "celestial bodies should not be subject to national appropriation by any claims of sovereignty."<sup>16</sup> This concept became a guiding principle, unanimously

<sup>12</sup>34 U.N. GAOR (Supp. No. 20), Annex I, 25, at 30 (1979). For articles setting forth in greater detail future space endeavors, see: Report U.S. Comp. Gen. (OP/197413), Appendix I, "The Near Term Potential of Manufacturing in Space" (Jan. 31, 1980); NASA, Space Settlements—A Design Study, SP-413, 56, 60, 87-110 (NASA SP-413 1977); NASA A Forecast of Space Technology 1980-2000," Part 2, Section 1, (NASA SP-387, Jan. 1976); NASA, Outlook for Space, a Report to the NASA Administrator by the Outlook for Space Study Group, 178-180 (NASA SP-386 Jan. 1976); Waldron, Erstfeld and Criswell, "The Role of Chemical Engineering in Space Manufacturing," Vol. No. 86 Chemical Engineering 80, (1979); Criswell, "Commercial Prospects for Extraterrestrial Materials," 7 J. Contemp. Bus. 153 (1978); Salkeld, "Space Colonization Now?" 13 Astronautics and Aeronautics 30 (1975); O'Neill, "Space Colonies and Energy Supply to the Earth," 190 Science 943 (1975); Criswell, Glaser, Mayor, O'Leary, O'Neill and Vajk, "The Role of Space Technology in the Developing Countries," a paper presented at NGO Forum on Science and Technology for Development, Vienna, Austria (Aug. 19-29, 1979).

<sup>13</sup>56 Dep. State Bull. (1967); reprinted in U.S. Sen. Staff Report, 90th Cong., Comm. on Aeronautical and Space Sciences, on 1967 Outer Space Treaty, 14 (Comm. Print. 1967).

<sup>14</sup>Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (hereinafter "Outer Space Treaty"), Jan. 27, 1967, [1967] 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205 (effective Oct. 10, 1967).

<sup>15</sup>Menter, "Astronautical Law," M59-119, I.C.A.F., 72, U.S. G.P.O. 1960 0-544683; reprinted in S. Doc. No. 26, 87th Cong. "Legal Problems of Space Exploration: A Symposium," Sen. Comm. on Aeronautical and Space Sciences 397 (1961).

<sup>16</sup>S. Doc. No. 18, 88th Cong. "Documents on International Aspects of the Exploration and Use of Outer Space, 1954-1962," Sen. Comm. on Aeronautical and Space Sciences 12 (1963).

adopted by the U.N. General Assembly<sup>17</sup> and reiterated in the 1967 Outer Space Treaty: "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."<sup>18</sup>

In past discovery and exploration of land on Earth, the validity of a claim of sovereignty over such land rested upon an "effective occupation" over a *terra nullius*. History is replete with conflicting claims leading to armed conflict. Without appropriate international accord, States which established settlements on celestial bodies in space might well be reluctant to then surrender whatever inchoate sovereignty rights they accrued by such settlement. The time to resolve this foreseeable problem is before the factual situation could develop.

The tenor of the 1967 Outer Space Treaty looked to international cooperation and understanding rather than national rivalry for exploring and using outer space and its celestial bodies.<sup>19</sup> Such exploration and use was declared in the initial article to be "for the benefit and interests of all countries" and "the province of all mankind."

Activities in space or on a celestial body are expressly permitted by private companies ("nongovernmental entities") of a State Party to the 1967 Outer Space Treaty; however, "authorization and continuing supervision" of such State is required.<sup>20</sup> This apparently does not mean that a Government representative is to be ever-present with the commercial space activity. Rather, that the responsible Government agency or agencies would issue apropos regulatory directives within statutory guidelines. By consultations, reports, inspections and investigation of reported discrepancies, compliance should be assured. To a great degree, the supervision would be similar to and by the same regulatory agencies that corporations are today concerned with on Earth.

The sponsoring State assumes international responsibility for the activities of the commercial concern and for assuring that its activities conform to the State's Treaty obligations.<sup>21</sup> The sponsoring State thus is liable for any damages sustained by another State or its nationals caused by the commercial concern's space object launched by, or whose launching was procured by, the sponsoring State.<sup>22</sup> Under the 1972 Liability Treaty, a rule of absolute liability is imposed upon the launching State for damages caused by the space object on the surface of the Earth or to aircraft in flight; liability for damages to another object in space is to be premised on fault.<sup>23</sup>

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<sup>17</sup>U.N.G.A. Res. 1721/XVI (Dec. 20, 1961), International Cooperation in the Peaceful Uses of Outer Space, *id.* at 226.

<sup>18</sup>Outer Space Treaty, *supra* note 14, Art. II.

<sup>19</sup>S. Rep. 90th Cong., *supra* note 13, at 22.

<sup>20</sup>Outer Space Treaty, *supra* note 14, art. VI.

<sup>21</sup>*Id.* art. IX.

<sup>22</sup>*Id.* art. VII.

<sup>23</sup>Convention on International Liability for Damages Caused by Space Objects, Mar. 29, 1972, [1973] 24 U.S.T. 2389, T.I.A.S. 7762, (effective Oct. 9, 1973), arts. II, III. If claim is made to the launching State, its recoupment against its commercial entity would be governed by the contract between them.

Ownership of objects of a commercial concern carried into outer space or constructed in outer space or on a celestial body is unaffected by their presence in outer space or on a celestial body.<sup>24</sup> In 1979, Congress authorized the NASA Administrator to obtain liability insurance for users of the Space Shuttle to protect them from third party damage claims resulting from approved space activities.<sup>25</sup>

Under the 1967 Outer Space Treaty, personnel of a commercial concern aboard a spacecraft or while on a celestial body or otherwise in outer space, and space objects of the commercial concern, are subject to the "jurisdiction and control" of the State of registry of the space object which carried them into space,<sup>26</sup> subject to agreed arrangements where another State under international law may also have jurisdiction.<sup>27</sup> This imposes on States the requirement of having authority to exercise jurisdiction and control. The present Congress is considering legislation<sup>28</sup> to extend U.S. jurisdiction over crimes aboard aircraft to spacecraft, and otherwise, over offenses where "the offense is committed by or against a national of the United States at a place outside the jurisdiction of any nation," which of course would embrace incidents on the moon or on space stations or other habitats in space.<sup>29</sup> However, suppose the offense on a U.S. space station or facility on the moon is committed by and against non-U.S. nationals. Quare,

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<sup>24</sup>Outer Space Treaty, *supra* note 14, art. VIII. Similar recital is contained in art. 12(1) of the proposed Moon Treaty ("Agreement Governing the Activities on the Moon and Other Celestial Bodies") which agreement, without objection in the U.N. General Assembly has been commended for States' signature and ratification. For U.N. Resolution and appended text of Moon Treaty, see U.N.G.A. Res. 34/68 (1979), Annex.

<sup>25</sup>Pub. L. 96-48 (enacted on Aug. 8, 1979) modified section 308 of the National Aeronautics and Space Act of 1958, as amended, providing for insurance and indemnification under regulations to be prescribed by the NASA Administrator. For a detailed discussion of the enactment, see Mossinghoff, "Managing Tort Liability Risks in the Era of the Space Shuttle," 7 J. Space L. 120 (1979).

<sup>26</sup>Outer Space Treaty, *supra* note 14, art. VIII. It may be noted that the Moon Treaty contains a similar recital of jurisdiction and control by Parties to the Treaty "over their personnel, space vehicles, equipment, facilities, stations and installations on the moon." See Moon Treaty, U.N.G.A. Res. 34/68 (1979), art. 12(1).

<sup>27</sup>Article II(2) of the Convention on Registration of Objects Launched Into Outer Space (1976), T.I.A.S. 8480 (effective September 15, 1976), provides that where there are two or more "launching States" jurisdiction may be exercised by a launching State other than the State of Registry in accordance with an agreement between or among the launching States. As such jurisdiction is not exclusive, a nonlaunching State having jurisdiction under other accepted principles of international law may exercise such jurisdiction pursuant to agreement with the launching State(s). For example, under the "nationality principle" a State's law making body can extend its jurisdiction over offenses by its nationals wherever occurring.

<sup>28</sup>*See*, S. 1722, 96th Cong., 1st Sess. (1979), H. R. 6915, 96th Cong., 1st Sess. (1979), which is currently under review of its sponsors for purposes of a bill proposal into the 97th Congress.

<sup>29</sup>*Id.* Proposed "Criminal Code Reform Act of 1980" S. 1722, 96th Cong., 1st Sess. (1979) brings spacecraft within the "special aircraft jurisdiction of the United States" (§203(c)) by the novel method of defining the word "aircraft" as "including any craft used or designed for flight or navigation in air or in space" (§111). The recital as to extraterritorial jurisdiction of the United States is set forth in §204 (j) of S. 1722. The bill was favorably reported out of the Senate Judiciary Committee, with amendments (see, S. Rep. No. 96-553). A similarly entitled House bill H. R. 6915, 96th Cong., has been introduced as H. R. 1647 in the 97th Congress.

whether U.S. jurisdiction would obtain under the further recital for extraterritorial U.S. jurisdiction where

the offense is comprehended by the generic terms of, and is committed under circumstances specified by, a treaty or other international agreement, to which the United States is a party, that provides for, or requires the United States to provide for, federal jurisdiction over such offense.<sup>30</sup>

While at this writing the foregoing proposal is yet to be enacted, the more immediate needs as to U.S. criminal jurisdiction over persons aboard U.S. Space Shuttle flights has been effected. On March 7, 1980, a final rule of the NASA Administrator was published in the Federal Register vesting "absolute authority" in the Commander of the Space Transportation System (STS) to enforce order and discipline during all flight phases of an STS flight and to take action necessary "for the protection, safety, and well-being of all personnel and on-board equipment, including the STS elements and payloads. . . ."<sup>31</sup> This was an exercise of authority vested in the NASA Administrator by the National Aeronautics and Space Act of 1958.<sup>32</sup> Violation of the STS Commander orders subjects the offender to a possible fine of up to \$5,000 or imprisonment for one year, or both.<sup>33</sup> Military personnel, wherever performing assigned duties, are additionally subject to U.S. jurisdiction under the Uniform Code of Military Justice.<sup>34</sup>

Objects and personnel of a commercial concern in outer space should be accorded the benefits recited in the "Rescue and Return of Astronauts Agreement."<sup>35</sup> The Agreement does not use the term "Astronaut" that appears in the title but speaks of rescue of "personnel of a spacecraft" and of obligations "to recover and return a space object" to the representatives of the launching State.<sup>36</sup> To safeguard the lives of all persons on the moon, the Moon Treaty expressly states that all persons on the moon are to be considered as "Astronauts" within the meaning of Article V of the 1967 Outer Space Treaty and as "personnel of a spacecraft" under the Astronaut Agreement.<sup>37</sup>

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<sup>30</sup>*Id.* § 204 (k), S. 1722. It will be recalled that under art. VIII of the Outer Space Treaty the State Party to the Treaty on whose registry an object launched into outer space is carried "shall retain jurisdiction and control over such object, and any personnel thereof, while in outer space or on a celestial body."

<sup>31</sup>14 C.F.R. §1214, 45 Fed. Reg. 14845-14846 (1980).

<sup>32</sup>§ 203 (c), § 304 (a), 42 U.S.C. 2455 (a), 2473 (c).

<sup>33</sup>18 U.S.C. 799.

<sup>34</sup>Art. 2, U.C.M.J., 10 U.S.C. 802.

<sup>35</sup>Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space, April 22, 1968, 19 U.S.T. 7570, T.I.A.S. 6599, 672 U.N.T.S. 119 (effective Dec. 3, 1968).

<sup>36</sup>*Id.* arts. 1-5.

<sup>37</sup>Moon Treaty, *supra* note 24, art. 10. Under Art. V of the Outer Space Treaty, astronauts are to be regarded as "envoys of mankind" and States Parties to the Outer Space Treaty are to "render to them all possible assistance" in the event of accident or distress; further, "astronauts of one State Party should render all possible assistance to the astronauts of other States Parties."

In light of the conceived space settlements, whether on the moon or on space stations in space, the need for extension of beneficial civil law to such habitats is readily foreseeable. This will require considerable study by international law specialists. One approach that should be examined is the precedent which Congress provided for the Trust Territories of the Pacific Islands. A High Commissioner of the Trust Territories, appointed by the President with the advice and consent of the Senate, was vested with all legislative, executive and judicial authority necessary for its civil administration.<sup>38</sup> It should be remembered that the jurisdiction then provided was over territory for which the United States did not have sovereignty. This, of course, would be analogous to the status of space stations in space or on the moon.

Would the proposed Moon Treaty enhance or restrict commercial activities in space? There has been some opposition expressed by members of the Congress. Individuals representing varying interests, magazine articles and some industry newspaper advertisements have urged the Government against signing and against ratification of the Treaty.

This opposition appears firmly to believe that private industry would not invest in space activities involving exploitation of the natural resources of the moon. Such belief is premised upon interpretation of undefined terminology of the treaty as requiring the sharing of resulting profits and perhaps business secrets with States that had not shared in the exploitation costs.

The apparent dilemma was introduced with the adoption of the phrase in Article 11(1) of the Moon Treaty: "The moon and its natural resources are the common heritage of mankind which finds its expression in the provisions of this Agreement, in particular in paragraph 5 of this article."<sup>39</sup> The referenced paragraph 5 recites,

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<sup>38</sup>48 U.S.C. 1681 (a) and 1681a.

<sup>39</sup>For text of Moon Treaty, see U.N.G.A. Res. 34/68 (1979), Annex. The "common heritage" concept was not in the initial proposed "A Draft Treaty Concerning the Moon" submitted by the U.S.S.R. in November 1971 to the U.N. First Committee of the General Assembly (U.N. Doc. A/C.1/L. 568) which draft was specifically taken note of by the U.N. General Assembly in its request to COPUOS and its Legal Subcommittee to consider as a priority matter the question of the elaboration of a draft international treaty concerning the moon, U.N.G.A. Res. 2779 (XXVI) (Nov. 29, 1971). The common heritage concept, however, had previously been suggested during the 1970 U.N. COPUOS Legal Subcommittee meeting by Argentina in a proposal dealing solely with the use of the natural resources of the moon and other celestial bodies (U.N. Doc. A/AC.105/C2/L.71 and Corr. 1). It was adopted in a U.S. draft proposal, during the 1972 Legal Subcommittee session, for a moon treaty (U.N. Doc. A/AC.105/C.2(XI)WP12 Rev. 1, April 17, 1972). Little progress was made from 1973 to 1978 when a draft revision of the remaining issues, after informal consultations, was proffered by Austria. It was generally recognized that if the key issue concerning natural resources of the moon was resolved that a compromise solution of the others would immediately follow. While the Legal Subcommittee was unable to reach a consensus during its 1979 session for want of time and the need for further consultation with home governments on a proposed compromise, the Subcommittee suggested that its parent Committee, COPUOS, in its forthcoming 1979 Session, consider its concluding a draft treaty (U.N. Doc. 105/240, April 10, 1979, pars. 35, 38). During the COPUOS meeting a compromise was adopted, suggested by Brazil, to limit the breadth of the term common heritage in exchange for withdrawal of a proposal for deferment of exploitation of the natural resources of the moon. This resulted in completion of a draft text for consideration by the U.N. General Assembly.

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. This provision shall be implemented in accordance with Article 18 of this Agreement.<sup>40</sup>

The "main purposes" of the international regime, as recited in Article 11(7), are to be the orderly, safe development and rational management of the natural resources of the moon, the expansion of opportunities in the use of such resources, and an

. . . equitable sharing by all States Parties in the benefits derived from the resources, whereby the interests and needs of the developing countries, as well as the efforts of those countries that have contributed either directly or indirectly to the exploration of the moon, shall be given special consideration."

Another recital presently concerned, in Article 11(3), provides:

Neither the surface nor the subsurface of the moon, nor any part thereof or natural resource in place shall become the property of any state, . . . or of any natural person.<sup>41</sup>

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<sup>40</sup>Moon Treaty, *supra* note 24, art. 18. The referenced art. 18 provides that consideration of the question whether exploitation is about to become feasible will be a provision agenda item of the U.N.G.A. ten years after the Treaty has come into force, and also be for elective consideration by a review conference at anytime after the Treaty has been in force for five years at the request of one-third of the States Parties to the Treaty with the concurrence of the majority of the States Parties.

<sup>41</sup>*Id.* par. 3 art. 11. Par. 3 of art. 11 continues: "The placement of personnel, space vehicles, equipment facilities, stations and installations on or below the surface of the moon, including structures connected with their surface or subsurface, shall not create a right of ownership over the surface or subsurface of the moon or any area thereof. . ." Other paragraphs of article 11, of concern, provide:

- "2. The moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means." (It may be noted that this wording is identical to that used in art. II, Outer Space Treaty, relative to "outer space, including the moon and other celestial bodies").
- "4. States Parties have the right to exploration and use of the moon without discrimination of any kind on a basis of equality, and in accordance with international law and terms of this Agreement." (This is similar to 2nd par., art. I, Outer Space Treaty.
- "8. All the activities with respect to the national resources of the moon shall be carried out in a manner compatible with the purposes specified in paragraph 7 of this article and the provisions of article 6, paragraph 2, of this Agreement."

The latter, reference in pertinent part, recites that

"States Parties may in the course of scientific investigation also use mineral and other substances of the moon in quantities appropriate for the support of their missions."

The substance of the par. 7 reference has been set out in the text of this paper.

It should be noted that the initial recital of the Moon Treaty provides that its provisions relating to the moon "shall also apply to other celestial bodies within the solar system, other than the earth. . ."

A reading of the Moon Treaty readily reveals the problems or issues concerned, such as ascertaining the conceptions envisioned by the use of the terms "common heritage of mankind," "an international regime to govern the exploitation of the natural resources of the moon," "as such exploitation is about to become feasible," "equitable sharing. . . in the benefits derived from those resources," "developing countries," "celestial bodies" (particularly as including asteroids) and "natural resources in place.

In legislative drafting, phrases used to resolve conflicting views sometimes give rise to problems of interpretation. Greater difficulty frequently arises where the drafting is by an international body, where language differences are present and where substantive changes in text may entail the representatives' obtaining clearance with their home State. In the Legal Subcommittee of COPUOS, agreement is obtained by consensus; that is, agreement is obtained only after no further objections are made to each of the provisions severally and collectively considered. As objections are made, piecemeal changes are suggested. Thus, while the end result intended by a revision is clear at the time made, a subsequent third party not having the benefit of the detailed consideration accorded the total draft effort may find the ultimate text wording faulty.

In interpretation of treaties, as with interpretation of statutes, resort may be had to limited aspects of its history to ascertain the intent of the measure and the meaning to be ascribed to terminology employed. The Vienna Convention on the Law of Treaties<sup>42</sup> reflects, in Articles 31 and 32, customary international law as permitting examination of U.N. documentation in the formulation of the several articles of the Moon Treaty and the consideration accorded the completed text.<sup>43</sup>

Assertion has been made that the wording of Article 11 (set forth in note 41), on its face, precludes national or private ownership or exploitation of the natural resources of the moon or celestial bodies, except pursuant to an international regime's governing regulations. In support of such non-ownership conclusion, reference is made to the express recital of paragraph 3 that "neither the surface or subsurface of the moon nor any part thereof or natural resource in place" shall become the property of any State or individual. Further, that rights of ownership shall not be created "over the surface or subsurface of the moon or any areas thereof" by placement of personnel, vehicles, equipment facilities, stations and installations "including structures connected with their surface or subsurface." It is stated that it is thus absurd to conclude that once you break off parts of the surface or subsurface, the prohibition against ownership no longer applies. Yet, such appears the very intention of the drafters, as examination of the

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<sup>42</sup>For text of Treaty, see "Executive L," 92nd Cong., 1st Sess., or Convention Doc. A/Conf. 39/27. While the Treaty was signed by the United States on April 24, 1970, it has not yet been ratified by the United States. However, arts. 31 and 32 here concerned, and the Treaty generally, reflects customary international law.

<sup>43</sup>Dep. Ass't. Legal Advisor for Treaties, Arthur W. Rovine, Dep't. of State, in conversation with author. For U.N.G.A. consideration, see U.N.G.A. Res. 34/68 (Dec. 14, 1979); 34 U.N. GAOR, (Supp. No. 20). For various working papers proffered by States, and texts considered by the Moon Treaty Working Group, see 1977 COPUOS Legal Subcommittee Report, Annex 1, U.N. Doc. AC/105/196 (April 11, 1977).

negotiated history will reveal. It was the United States in 1973, that proposed the insertion of the phrase in Article 11(3) of "or natural resources in place" before the words "shall not become the property of. . ." etc. The U.S. Representative at the 1973 Legal Subcommittee meeting explained that the intent of the words "in place" was "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 prerogative period or, subject to the rules and procedure that a regime would constitute, following establishment of the regime."<sup>44</sup> The intent, being thus ascertained, governs and should resolve the issue.

The negotiated history also will sustain the conclusion that the Treaty contemplates exploitation of the natural resources of the moon and other celestial bodies with no deferment of exploitation pending establishment of an international regime to govern the exploitation.<sup>45</sup>

The U.S.S.R. for years did not accept the concept of the natural resources of the moon as the "common heritage of mankind," preferring to substitute the prior understood phraseology of "common province of mankind;" that is, celestial bodies being "available for the undivided and common use of all States, but not jointly owned by them."<sup>46</sup> It was not until the final day of the COPUOS meeting (July 3rd of its 1979 session) that the U.S.S.R. acceded to the circumscribed Brazilian proposed compromise recital of the natural resources of the moon as the common heritage of mankind "which finds its expression in the provisions of this agreement and in particular in paragraph 5 of this article."

While the meaning of "common heritage" is to be confined to the Moon Treaty itself, particularly to the recital in paragraph 5 concerning the States' undertaking to

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<sup>44</sup>See Hosenball, 7J. Space L. 95, 103 (1979). It is interesting to note in this connection the observation in the recently published Manual for Space Law on the non-appropriation provision (art. II) of the Outer Space Treaty.

. . . It would appear that the framers of the 1967 Treaty had in mind immoveable concessions. As soon as a portion of the soil is removed, it is regarded as a moveable rather than an immoveable object. Consequently, nothing would prohibit the extraction, sale or exchange of soil and rocks. . . (Jasentuliyana & Lee, I Manual of Space Law 264 Oceana Sijthoff (1979).

It should be noted that the foregoing was in consideration of samples removal.

<sup>45</sup>See par. 65, 1979 COPUOS Report, 34 U.N.GAOR (Supp. No. 20). See also, statement of Neil Hosenball, Chairman of U.S. Delegation to 1979 COPUOS Meeting, given on July 3, 1979: "The draft agreement. . . as part of the many 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." Quoted in Hearings on International Space Activities before the House Committee on Science and Technology, 96th Cong., 1st Sess. at 86 (1979). Note may also be made of earlier proposals for deferment of exploitation, which were rejected; for example, U.N. Doc. A/AC.105/101, par. 21; India Working Paper, March 27, 1973, republished in U.N. Doc. AC/105/196, Annex 1 at 10. The compromise reference by Mr. Hosenball is believed to include the withdrawal on the session's last day of a proposal for deferment of exploitation; such compromise resulted in the COPUOS achieving a consensus on the final text. See also, Petree, U.S. Dept. Rep. to U.N. Security Council, in U.N.G.A. Special Political Committee on Report of COPUOS and the Moon Treaty (Press Release U.S.U.N.-107(79) (Nov. 1, 1979).

<sup>46</sup>"U.S.S.R. Working Paper" U.N. Doc. A/C.105/101 (1973).

establish an international regime to govern the exploitation of natural resources, there is presently no accepted unequivocal recital as to the practical meaning of the required "equitable sharing" with other States or of the "special consideration" to be accorded to "the interests and needs of the developing countries."<sup>47</sup> While the initial common heritage proposal in the COPUOS Legal Subcommittee, which was by Argentina, may have been patterned after such phrases as were used in the Law of the Sea proposals<sup>48</sup> and may have intended an equitable sharing of the *profits* derived,<sup>49</sup> it should be clear that in light of the U.S.S.R. rejection of such concept and the compromise proposed by Brazil (said to be on behalf of the developing States), a more restricted meaning growing out of the Moon Treaty itself must result. As the Moon Treaty is an expansion of the basic concepts of the 1967 Outer Space Treaty with ample indication that it does not intend to override such Treaty,<sup>50</sup> argument has been made that the "benefits sharing" may be similar to that required by the 1967 Outer Space Treaty's initial recital: "The exploration and use of outer space, including the moon and other celestial bodies shall be carried out for the benefit and in the interests of all countries."<sup>51</sup>

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<sup>47</sup>Moon Treaty, *supra* note 24, art. 11.

<sup>48</sup>"Argentina Working Paper," U.N. Doc. 105/196 (Annex I) (1973) whose two final paragraphs at p. 16, recite:

The major merit of replacing the vague expression 'province of all mankind' by the more meaningful expression 'common heritage of all mankind' is that in so doing one has specified the commencement of an action, replacing an abstract statement by a means of operating, within a specified legal framework.

The fact that General Assembly Resolution 2749 (XXV) on the seabed was adopted without any dissenting vote is definite proof of the existence of this legal viewpoint common to all States, entirely irrespective of their special internal features, their philosophical ideas or their policies.

<sup>49</sup>*Id.* at 15-16. Final consequences envisioned by the Moon Treaty were enunciated by Argentina as:

A realization on the part of all States and Peoples that they are entitled to the benefits derived from the principles and norms established for outer space and celestial bodies;  
 The need to link to the exploration and use of space and celestial bodies the exploitation thereof;  
 The search for profit. . . ;  
 Equitable sharing of the profits derived;  
 Consideration of the needs and interests of developing countries;  
 Supervision of this activity with a view to equitable distribution;  
 The institution of an international regime;  
 The establishment of appropriate procedures for such a regime;  
 The existence of international machinery or an international authority to give effect to all the expectations that have been voiced.

<sup>50</sup>Petree, *supra* note 45, at 5.

<sup>51</sup>*Id.* at 7. In reference to art. 11 para. 7(d), Petree stated:

This language also reflects the international cooperation that exists to-day in the communications and other practical applications of space: for example, Intelsat, Intersputnik and Inmarsat, where those States who have expended large resources, either public or private, to develop space systems to exploit these applications have equitably shared the benefits with the international community.

This writer has no present conclusion as to the construction to be accorded the "equitable sharing" paragraph. It will be the international regime and appropriate procedures, agreed upon in a separate agreement that will ultimately determine the breadth of application of the equitable sharing principle. Such further agreement will not be binding upon the U.S.S.R. and the U.S. without their concurrence in its provisions.<sup>52</sup> If the U.S. does not agree to the governing regime proposed, it nevertheless would remain obligated under Article 11(8) of the Moon Treaty to conduct its exploitation of moon resources compatibly with the purposes specified in paragraph 7 of such article, the provisions of Article 6 on scientific investigations and Article 7 for environmental protection, which provisions were originally proposed by the U.S.<sup>53</sup> The requirements for compatibility with Article 11(7) would require unilateral determination by the U.S. of the obligations envisaged for "equitable sharing" of benefit derived from the resources and for determining the extent of scientific investigations for which natural resources of the moon may be extracted. The referenced environmental protection obligations include action "to prevent harmfully affecting the environment of the earth through the introduction of extraterrestrial matter or otherwise."<sup>54</sup>

Asteroids are celestial bodies whose resources may well be utilized at far less cost than resources from the moon or Earth in building space stations or habitats in space.<sup>55</sup> It had been this writer's belief that asteroids should have been expressly excluded from the Moon Treaty.<sup>56</sup> However, it may be noted that under Article 6(2) of the Moon Treaty, minerals and other substances may be extracted from asteroids (as celestial bodies) in quantities appropriate for the support of "scientific investigations." In the absence of a limiting definition, the initial endeavor to use natural resources of the moon or of asteroids, to establish a space station for solar energy collection and transmission or for various experiments, or to determine feasibility of commercial enterprises in space, might well be determined as within the term "scientific investigations."

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<sup>52</sup>*Id.* at 6, relating that a separate treaty would be required, subject to advice and consent of the Senate. See also: Hosenball, Hearings International Space Activities *supra* note 45, at 96, 99. In part, Mr. Hosenball testified "There is nothing . . . in the Moon Treaty that binds us to anything in any follow-up conference, and the world, I think, may be a lot different when exploitation is proven feasible on a commercial scale, and that common heritage may mean something completely different then." *Id.* at 96.

<sup>53</sup>*Id.* at 99.

<sup>54</sup>Moon Treaty, *supra* note 24, art. 7(1).

<sup>55</sup>Asteroids as Resource for Space Manufacturing, Section IV, NASA SP-428 (1979), 159-204. An earlier study states ". . . the total quantity of materials within only a few known asteroids is enough to permit building space colonies with a total land area many thousand times that of the Earth," Space Settlements-a Design Study, NASA SP-413 at 60 (1977).

<sup>56</sup>Menter, "The Impact of Treaties on Commercial Space Operations" 16, a paper for the American Astronautical Society Annual Meeting on The Industrialization of Space (San Francisco, Oct. 18-20, 1977). A conclusion recited was ". . . in light of the desire . . . to possibly consume asteroids in the construction of space stations, consideration should be given to whether it is desired (in the pending Moon Treaty) to expressly exclude asteroids from the term 'celestial bodies'." It is noted that an exclusion is recited for extraterrestrial materials which reach the surface of the Earth by natural means, such as meteorites (art. 1(3)).

Environmental protection has been herein indicated as a continuing responsibility of States in their exploration and use of the moon and other celestial bodies (Article 7(1)). This, however, is not to be construed as prohibiting the exploitation of natural resources on celestial bodies, but to require that the manner of such exploitation "minimize any disruption or adverse effects to the existing balance of the environment."<sup>57</sup>

Shortly after Sputnik I, Senator Kenneth B. Keating stated that "a genuine international effort to define the rights of all nations in space is one of the world's compelling needs. Anarchy in space could be more dangerous than anarchy on Earth. . . ."<sup>58</sup> With the 1967 Outer Space Treaty, a new status was given to activities and discoveries in outer space different than those enjoyed by nations and their nationals on Earth. Disclaimer of sovereignty over the moon and other celestial land masses was intended to obviate possible conflicts over "territorial claims;" rather, such celestial "territories" are now the province of all mankind, and their exploration and use are to be carried out for the benefit of all countries. International cooperation, rather than international rivalry, was the hallmark of the 1967 Outer Space Treaty. Activities in space are "national" activities and a State is responsible for the activities of such private enterprises in space as it may authorize.

The Moon Treaty and the three other space law treaties which became effective following the 1967 Outer Space Treaty amplify pertinent provisions of the 1967 Treaty. In similar fashion to the 1967 Outer Space Treaty, the Moon Treaty provides general guidance as a basis for determining future specifics, should commercial exploitation of celestial resources prove feasible. Similarly also, the time to do so is before these events occur; otherwise, a State may be reluctant to surrender vested benefits.

We are on the threshold of a great expansion in space activities. It is plausible that international controls will be sought for the common good of all States. Rather than each State and its authorized private enterprises in space determining the extent of its authority and its obligations to other States, agreed concepts under an international regime should govern. Such control on behalf of all States should serve to protect the biosphere, as well as assure the equitable sharing envisaged from exploitation of the moon's resources.

It is, of course, clear that if a commercial enterprise in outer space is not concerned with utilization of celestial bodies or with the exploitation of their natural resources,

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<sup>57</sup>U.N. Doc. 1979 COPUOS Comm. Report, *supra* note 45, par. 65, at 11. It may be recalled that a 1974-1975 National Academy of Sciences Study, "Environmental Impact of Stratospheric Flight," pointed out foreseeable adverse biological and possibly climatic effects of aircraft emissions in the stratosphere (N.A.S. Printing, 1975). The most clearly established problem was the potential reduction of ozone in the stratosphere, leading to an increase in biologically harmful ultraviolet light at ground level resulting in an increase in skin cancer. A recent study by the International Astronautical Federation recites that "A further consideration in the expanded use of new [space] transportation systems, whether or not they themselves are reusable, is the inevitable increase in quality of the propellant combustion products which are deposited in the various layers of the atmosphere. Such products, even the water vapor generated by the combustion of hydrogen and oxygen, clearly have global effects, and therefore the consequences of their deposition in the atmosphere should be considered by an international body." U.N. Doc. A/AC.105/244, Secretariat's Report—International Implications of new Space Transportation Systems 19 (August 16, 1979).

<sup>58</sup>Keating, Hearings on the International Control of Outer Space before the House Comm. on Science and Astronautics 86th Cong., 1st Sess. (1959).

their space enterprises would not be affected by the presently proposed Moon Treaty. If the commercial enterprise is concerned with exploitation of such natural resources, the Moon Treaty, rather than being an obstacle, may serve as the legal basis for its resources exploitation activity. Mr. Neil Hosenball, the chairman of the U.S. delegation to the COPUOS meeting which reached consensus on the text of the Moon Treaty made the following statement at a Congressional hearing on September 6, 1979: "I think the treaty. . . does contain some very positive things. For example, there would have been a question without this treaty whether there was any right to exploit natural resources at all, whether you could gain ownership and control over natural resources."<sup>59</sup>

Aerospace technology has developed into a major segment of American industry. It has had and continues to have a major role in Government space activities. Many technologies from Government financed space research have spun off into commercial uses. It remains the Government policy to transfer to the private sector major space endeavors that have commercial potential. In construction of space stations, with the view of various commercial enterprises thereon, the major initial funding undoubtedly will be primarily that of Government. As private sector operation is contemplated, participation of the private sector in the planning stages is desirable.

In the growth of the nations, Congress has provided incentives to the private sector to undertaken new ventures—as in land grants to the railroads in the nation's westward expansion, subsidies to air carriers to develop air transportation and tax deductions for petroleum exploration. Where beyond normal risks are involved, the Government has assumed the risk for payment of damage compensation, as in the development of atomic energy. To induce private sector use of the Space Shuttle—as previously mentioned, Congress has provided for acquisition of insurance against third party liability with broad discretion in the NASA Administrator.<sup>60</sup> In light of the hearings on various measures of the 96th Congress, there appears to exist a recognition for greater support for private sector participation and entrepreneurial enterprises in outer space activities: for example, H.R. 2337, 96th Congress, a Bill to establish a Space Industrialization Corporation which would provide Government funds to private enterprises (with repayment if the endeavor is financially successful) to promote, encourage and assist in the development of new products, processes and industries in the space environment.<sup>61</sup> Other proposals and studies within the Senate previously noted look to the enhancement of private sector involvement in space endeavors.<sup>62</sup>

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<sup>59</sup>Hearings on *International Space Activities before the House*, 1979, *supra* note 45, at 96.

<sup>60</sup>See note 25 *supra*.

<sup>61</sup>H.R. 2337, 96th Cong., 1st Sess. (1979) introduced by Cong. Don Fuqua, Chairman of the House Science and Technology Committee. It recites that its enactment would assure private industry of an effective and realistic opportunity to develop the activities involved into viable and profitable commercial ventures.

<sup>62</sup>See note 5 *supra*. That increased funding by the Government, for increased private sector space activity, as being necessary is emphasized in a Report by the Comptroller General of the United States to Sen. Adlai E. Stevenson, then Chairman of the Senate Subcommittee on Science, Technology, and Space, Committee on Commerce, Science and Transportation. The Report is entitled "U.S. Must Spend More to Maintain Lead in Space Technology." Comp. Gen. B-197413, (1980).

The New York Times of September 13, 1979, carried a large boxed article reflecting an interview with Hon. Edward R. Finch, Jr., the title of which reflects his views—"Time for Earthlings to Sign a Moon Treaty", and this writer agrees.

It is the hope of this writer that the private sector may yet concur with the U.S.'s becoming a Party to the Moon Treaty and provide guidance to the Government as to recitals for the subsequent agreement on the international regime, its procedures and regulations governing the exploitation of natural resources of the moon and other celestial bodies. Among matters to be determined are the nature of the international regime, and a clarification of the benefits and equitable sharing to be accorded other States. As risk capital will be involved, to what extent should there be a recoupment of costs and other entitlements in sharing resources or benefits accruing therefrom? Should benefit sharing be extended to activities to which the exploited resources are applied? Should still later developed commercial space activity aboard a space station constructed in part from exploited resources be included? As many years will surely elapse before exploitation of natural resources can be determined to be commercially feasible, experience gained may well assist in ascertaining benefit allocations.

Industry is naturally aware of the U.S. Government's philosophy for private sector ownership and operation of the means of production and distribution. It is hoped that industry will participate in the planning for its future role in space activities and assist the Government towards these ends by financial participation where possible, and by advising the nature and extent of Government support required.

Notwithstanding the clarifying recitals in the negotiated history of the Moon Treaty, well motivated attorneys find the Treaty's wording so equivocal as to conclude that investment by private capital in related space activities is not warranted. This appears to be an overreaction. In light of the clarification in the negotiated history, it is suggested that in the U.S. government's signing the Treaty and in the Senate Resolution of Ratification there be set out an "understanding" of questioned Treaty provisions to accord with the clarification.<sup>63</sup>

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<sup>63</sup>Vienna Convention on the Law of Treaties, arts. 19, 23. The procedure is believed to be substantially as follows. The recital in essence would state: "Subject to the following understanding premised upon the negotiated history of the Treaty:

a. With regard to Article 11-

- 1) Paragraph 1. The term "common heritage of mankind" derives its meaning solely from its use in this Treaty. As such, it. . . (ect.)
- 2) Paragraph 3. The insertion of the phrase "or natural resources in place" is a limitation on the recited prohibition of ownership of portions of the surface of the moon; however, such ownership may obtain when the natural resources upon exploitation are no longer "in place."
- 3) Paragraph 4. Exploration and use of the moon without discrimination includes its exploitation. This interpretation is confirmed by the recital in last sentence of Article 6, paragraph 2.

In light of the U.S.S.R.'s early and consistent views on the common heritage doctrine until a satisfactory compromise was agreed upon, which restricted to the Treaty the meaning to be derived from that doctrine, and in light of further withdrawn proposals for deferment of exploitation of resources, U.S.S.R. acceptance of the U.S. "understanding" appears probable. With both major space powers in accord, other States should more readily agree, particularly States which had participated in the formation of and consensus on the Treaty at the 1979 COPUOS Meeting and who thus are familiar with its negotiated history.

The Treaty is presently open for signature by all States. Setting forth the U.S. understanding, and the basis thereof, should preclude later criticism based on a reading of the Treaty without benefit of its negotiated history. With acceptance of the U.S. understanding, greater interest of the private sector should exist for participation in space activities involving exploitation of the moon and other celestial bodies.

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Paragraph 5. The undertaking to establish a regime does not defer exploitation. The international regime and the procedures and regulations to govern resources exploitation are subjects for a separate treaty negotiation to be undertaken following review conference (convened pursuant to Article 18) determination that such exploitation is about feasible.

The foregoing is but an example. Following the Senate's extensive hearings more items to be covered and the position justifications will be determined. The Resolution of Ratification on receipt and concurrence by the President would be transmitted to the U.N. Secretary General who would send it to other Treaty signatories and adherents for their acceptance or objection. An objection to preclude entrance of the Treaty into force between the U.S. and the objector must specifically reject the U.S. recital of understanding. If no objection is made within one year, the U.S. understanding is deemed accepted. See art. 20, paras. 4(b) and 5 of the Vienna Convention on the Law of Treaties, *supra* note 42.