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out of human activities in outer space

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LAND MOBILE SATELLITE COMMUNICATIONS: A FURTHER DEVELOPMENT IN INTERNATIONAL SPACE LAW (PART II)

Dr. Wolf von Noorden*
and
Phillip Dann**

Introduction

In the first part of this article, we set out the background to recent amendments to the INMARSAT Convention and Operating Agreement.¹ These extend the competence of the Organization, enabling it to provide land mobile-satellite services. We also described the amendment process. It is now necessary to consider in some detail the amendments themselves.

The Land Mobile Amendments

The crucial amendments are to Article 3 of the INMARSAT Convention, which sets out the purposes of the Organization. Paragraphs (1) and (2) now read as follows:

(1) The purpose of the Organization is to make provision for the space segment necessary for improving maritime communications and, as practicable, aeronautical and land mobile communications and communications on waters not part of the marine environment, thereby assisting in improving communications for distress and safety of life and communications for air traffic services, the efficiency and management of transportation by sea, air and on land, maritime, aeronautical and other public correspondence services and radiodetermination capabilities.

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The views expressed in this article are those of the authors and are not necessarily those of any organization with which the authors are or have been connected.

1. See von Noorden & Dann, *Land Mobile Satellite Communications: A Further Development in International Space Law (Part I)*, 17 J. SPACE L. 1 (1989). See also Convention on the International Maritime Satellite Organization (INMARSAT), Sept. 3, 1976, 31 U.S.T. 1, T.I.A.S. No. 9605 (hereinafter "Convention"); Operating Agreement on the International Maritime Satellite Organization (INMARSAT), July 16, 1979, 31 U.S.T. 1, T.I.A.S. No. 9605 (hereinafter "Operating Agreement"). For the "amendments" herein discussed, see Assembly/6/16,4,2,7 and Annexes IV to XI,

- (2) The Organization shall seek to serve all areas whether there is a need for maritime, aeronautical and other mobile communications.

This text therefore extends the competence of the Organization into two new areas: land mobile communications and communications on waters not part of the marine environment.

The introduction of the concept of "waters not part of the marine environment" should be explained. The original version of Article 3(1) provided that the purpose of the Organization was ". . . to make provision for the space segment necessary for improving *maritime* communications, thereby assisting in improving . . . efficiency and management of *ships, maritime public correspondence services* . . ." Article 1(f) provided that "ship" meant "a vessel at any time operating in the marine *environment* . . ." (emphases added).

The phrase "marine environment" seems to have a wider meaning than "sea": it includes areas close to or associated with the sea which are not part of the sea itself, such as the air space immediately above the sea. "Maritime" seems to have its ordinary meaning, namely, that which relates to the sea as opposed to other waters, such as inland lakes and rivers. There is no reason to suppose that the word is used in the extended sense found in some national legal systems, so as to apply to inland waters which are navigable by sea-going ships.² Indeed, the use in a related context of the phrase "marine environment" points strongly in the other direction because it is extremely difficult to interpret "marine environment" so as to include any area of fresh water.

It is obvious that the high seas, territorial sea, contiguous zone, archipelagic waters, exclusive economic zone and continental shelf, as defined in the U.N. Law of the Sea Convention (1982), are all within the "marine environment." Communications to or from these areas are "maritime communications." The same is not always true of internal waters.³ These consist in part of sea areas, such as ports and those bays which are behind the baseline of the territorial sea. They also consist of inland waters, such as lakes, canals and rivers. Therefore, internal waters are partly within the marine environment and partly outside. It may be suggested that the division occurs where waters cease to be tidal.⁴

2. In the United States, for example, admiralty jurisdiction extends to navigable, non-tidal waters: Geoffrey Marston, *Admiralty Law*, in *ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW* 1, 3 (Bernhardt ed. 1989).

3. For the concept of internal waters, see M. SORENSEN, *MANUAL OF PUBLIC INTERNATIONAL LAW* 332 (1968).

4. Although this interpretation is based principally on the ordinary meaning of the words "marine" and "maritime", the division between tidal and non-tidal waters is still relevant in some systems of municipal admiralty law; see e.g., *The Powstaniec Wieikopolski*, 1 All E.R. (1989) (law of salvage in the United Kingdom). This distinction is not always made in municipal law, however; see note 2, above.

INMARSAT's original competence was to provide maritime communications. This does not mean that, for example, ships sailing up-river from an estuary have been prohibited from using the INMARSAT system. However, the strict view must be that INMARSAT has provided services to such ships on an ancillary basis.⁵ It was considered desirable to provide an express competence for such services at the same time as providing an express competence for services to land-based users. The inelegant phrase "waters not part of the marine environment" was chosen for want of any better. The expression "internal waters" could not be used because it includes certain sea areas. The expression "internal waters" is sometimes used in the same sense. It is arguable that the phrase "land mobile communications" includes communications to and from waters not part of the marine environment. This is a common meaning in commercial usage. However, it was thought better to avoid ambiguity by referring specifically to such waters.

The effect of the amendments, therefore, is to give INMARSAT the competence to provide all types of mobile-satellite communications. Taking this into account, one of the amendments originally proposed by the Federal Republic of Germany was to change the name of the Organization to the "International Mobile Satellite Organization." There was no proposal to change the official acronym "INMARSAT," which has achieved wide recognition. The Meeting of Experts⁶ considered the change of name "INMARSAT," but did not reach a consensus on the proposal.⁷

Some parties considered that it would be premature to change the name at a time when the Organization was already well-established as a provider of maritime communications but was about to provide regular aeronautical and land mobile services for the first time. It was also felt by some parties that the original maritime purpose of the Organization should be reflected in its name. The proposal to change the name was not adopted by the Assembly although the Assembly noted that the Council will keep under review the possibility of changing the name of the Organization, taking into account the development of new services.⁸

The Assembly did, however, adopt several amendments which were consequential upon the broadening of the competence of the Organization. In the Preamble to the Convention, as amended, it is taken into account that ". . . world trade is dependent upon transportation by sea, air *and on land*" (emphasis added). It is also affirmed that ". . . a maritime satellite system shall also be open for aeronautical and land mobile communication and communications on waters not part of the marine environment for the benefit of all nations." This paragraph reflects neatly both the maritime

5. The provision of services by INMARSAT on an ancillary basis is discussed in Part I of this article. Von Noorden & Dann, *supra* note 1, at 4-5.

6. *Id.* at 10-11.

7. ASSEMBLY/6/3, ATTACHMENT, ANNEX V, at 1.

8. ASSEMBLY/6/REPORT, PARA. 4.2.6.

origins of the Organization and the evolution of a shared mobile-satellite system.

In Article 1 of the Convention, which sets out various definitions, the definition of "ship" in paragraph (f) is extended so as to mean ". . . a vessel of any type operating in the marine environment *or on waters not part of the marine environment . . .*" (emphasis added). Two new definitions are added to Article 1:

(i) "Mobile earth station" means an earth station in the mobile-satellite service intended to be used while in motion or during halts at unspecified points.

(j) "Land earth station" means an earth station in the fixed-satellite service or, in some cases, in the mobile-satellite service, located at a specified fixed point or within a specified area on land to provide a feeder link for the mobile-satellite service.

These definitions are taken from the Radio Regulations. Both definitions are of generic terms: a mobile earth station may be a ship earth station, aircraft earth station or land mobile earth station. Correspondingly, a land earth station may be a coast earth station, aeronautical earth station or base earth station.⁹

The amendments to Article 7 of the Convention, which deals with access to the space segment, illustrate a drafting problem which recurred in other amendments. Paragraph (1) originally provided as follows:

The INMARSAT space segment shall be open for use by ships and aircraft of all nations on conditions to be determined by the Council. In determining such conditions, the Council shall not discriminate against ships or aircraft on the basis of nationality.

In extending this provision to take into account land mobile communications, one possible approach would have been to add a reference to "land transport" or "vehicles." Alternatively, as one Party proposed, one could remove the specific reference to ships and aircraft and substitute a generic term, such as "mobile units" which would include land transport. The alternative approach has the obvious advantage of simplicity, although there is perhaps a symbolic value in enumerating the user groups which INMARSAT is committed to serve.

Both approaches, however, raise problems. First, land mobile communications are not confined to communications to and from vehicles.

9. This terminology is taken from the International Telecommunications Union, Radio Regulations, Dec. 6, 1979, art. 1, sec. IV.

As previously mentioned,¹⁰ there are mobile earth stations which are transportable but are not intended for use on vehicles. There are also future prospects for mobile earth stations which are small enough to be carried on the person. The second problem is that, whereas ships and aircraft both have a nationality under public international law, the various forms of land transport do not.

Taking into account these considerations, Article 7(1) of the Convention is now amended as follows:

The INMARSAT space segment shall be open for use by ships and aircraft of all nations and by mobile earth stations on land on conditions to be determined by the Council. In determining such conditions, the Council shall not discriminate among ships or aircraft or mobile earth stations on land on the basis of nationality.

The decision to refer to the mobile earth station rather than the vehicle carrying it overcomes both problems. It takes account of the fact that mobile earth stations on land may not be mounted on vehicles. It also makes it easier to establish the national connection which is necessary in this and in other provisions of the INMARSAT Convention and Operating Agreement. It is difficult to speak of the "nationality" of a vehicle in international law; it is easier to speak of the "nationality" of a mobile earth station. A mobile earth station can be said to have the "nationality" of the State which licenses the establishment of that mobile earth station, pursuant to Article 24 of the ITU Radio Regulations. However, this is not a connection of nationality in the strict sense. This explains why one further drafting approach could be excluded: that of deleting the specific references to ships and aircraft and substituting a general reference to "mobile earth stations."

The same problem of national attribution arose in two other contexts. Article 32 of the Convention provided in part as follows:

(3) On becoming a Party to this Convention, or at any time thereafter, a State may declare, by written notification to the Depositary, to which Registers of ships, to which aircraft operating under its authority, and to which land earth stations under its jurisdiction, the Convention shall apply.

The latest amendments modify this text so that it now reads: ". . . to which Registers of ships, to which aircraft and mobile earth stations on land operating under its authority, etc."

10. See von Noorden & Dann, *supra* note 1, at 3.

A similar amendment was introduced in Article V(2) of the INMARSAT Operating Agreement, which deals with the calculation of investment shares in the Organization. The background to this provision should be explained. Article 5(1) of the Convention provides that the Organization shall be financed by the contributions of Signatories, and that each Signatory shall have a financial interest in the Organization in proportion to its investment share which shall be determined in accordance with the Operating Agreement. Article V(1) of the Operating Agreement provides that investment shares of Signatories should be determined on the basis of utilization of the INMARSAT space segment. Article V(2) of the Operating Agreement provided as follows:

For the purpose of determining investment shares, utilization in both directions shall be divided into two equal parts, a ship or aircraft part and a land part. The part associated with the ship or aircraft where the traffic originates or terminates shall be attributed to the Signatory of the Party under whose authority the ship or aircraft is operating . . .

The latest amendments modify this test as follows:

For the purpose of determining investment shares, utilization in both direction shall be divided into two equal parts, a mobile earth station part and a land part. The part associated with the ship or aircraft or mobile earth station on land where the traffic originates or terminates shall be attributed to the Signatory of the Party under whose authority the ship or aircraft or mobile earth station on land is operating . . .

This illustrates the pragmatic approach adopted in drafting the amendments. In the first sentence, the generic term "mobile earth station" is used because it is both appropriate and convenient. In the second sentence, however, it is necessary to enumerate in turn "ship or aircraft or mobile earth station on land," for the reasons discussed in relation to Article 7 of the Convention.

During the amendment process, one party proposed that land mobile-satellite communications should have a lower priority than maritime or aeronautical communications. This proposal was rejected. The three types of communications are provided on the same basis, subject only to the distinction made in Article 3(1) of the Convention: "the purpose of the Organization is to make provision for the space segment necessary for improving maritime communications and, as practicable, aeronautical and land mobile communications and communications on waters not part of the marine environment . . ." The distinction introduced by the words "as

practicable" was first made in the 1985 amendments. The intention was to ensure that the Organization had the discretion, but not the obligation, to provide aeronautical-satellite services.¹¹ This distinction has been carried through in the recent amendments, so that land mobile-satellite communications are to be offered on the same basis as aeronautical-satellite communications. However, this does not create any order of priority between the three types of communications; insofar as the Organization has decided to offer aeronautical and/or land mobile communications, these will have the same priority as maritime communications.

In one other respect, both aeronautical and land mobile communications are distinguished from maritime communications. Article 8 of the Convention originally provided as follows:

A Party shall notify the Organization in the event that it or any person within its jurisdiction intends to make provision for, or initiate the use of, individually or jointly, separate space segment facilities to meet any or all of the purposes of the INMARSAT space segment, to ensure technical compatibility and to avoid significant economic harm to the INMARSAT system.

This introduces the so-called obligation of "coordination" with other space segments.¹² It was decided in 1985 that it would not be appropriate for this limited protection from competition to apply to INMARSAT's aeronautical communication services. Article 8(1) was therefore amended so as to refer to ". . . any or all of the *maritime* purposes of the INMARSAT space segment . . ." (emphasis added). When the land mobile amendments were proposed, there was a general consensus that land mobile communications offered by INMARSAT should, in this respect, be treated on the same basis as aeronautical communications. It was unnecessary to amend Article 8(1) further in order to achieve the desired result.

A further amendment which should be mentioned in this context is the new paragraph added to Article 7:

(4) Use of the INMARSAT space segment by mobile earth stations within land territory under the jurisdiction of a State shall be subject to the regulations governing radio communications of that State, and shall not be detrimental to that State's security.

11. See von Noorden, *Space Communications to Aircraft: A New Development in International Space Law (Part II)*, 15 J. SPACE L. 147, 150-51 (1987).

12. Analogous obligations exist in article XIV of the INTELSAT Agreement see International Telecommunications Satellite Organization Satellite Organization (INTELSAT) Agreement, Aug. 20, 1971, 23 U.S.T. 3813, T.I.A.S. No. 7532.

Although this appears to introduce a special principle applicable to land mobile communications, in reality the same principle applies to maritime and aeronautical communications. The right of States to regulate telecommunications within their respective territories is established by customary international law and is recognized in the Preamble to the International Telecommunication Convention (1982). Membership of INMARSAT does not affect this sovereign right. Thus, INMARSAT parties are under no obligation to allow INMARSAT ship earth stations to be used in their territorial sea, ports or internal waters.¹³ Similarly, aircraft fitted with INMARSAT aeronautical earth stations may not use them in the air space of a State without its consent, even if that State is an INMARSAT Party.¹⁴

Strictly speaking, therefore, the new Article 7(4) is redundant. However, when the land mobile amendments were proposed there were already plans in various countries to establish domestic mobile-satellite systems, offering services to the land mobile, coastal shipping and possibly aeronautical markets. Those parties which were considering such domestic systems wanted it to be established beyond doubt that they would have no obligation to permit INMARSAT services to be offered within their respective territories in competition with their domestic land mobile systems. Therefore, the new Article 7(4) may be seen as having more political than legal significance.

Article 7(2) gives explicit recognition to a long-standing practice under which use of the INMARSAT space segment has been authorized on an exceptional basis for land-based fixed communications.¹⁵ It was felt that the provision of such communications should be authorized expressly. It was decided that the most appropriate way to do this was to treat the provision of land-based fixed communications on the same basis as the provision of communications to the off-shore industry. Article 7(2), as amended in 1985, provides as follows:

The Council may, on a case-by-case basis, permit access to the INMARSAT space segment by earth stations located on structures operating in the marine environment other than ships, if and as long as the operation of such earth stations will not significantly affect the provision of service to ships or aircraft.

The origin of this provision stemmed from a fear that the off-shore drilling industry might place excessive demands on the use of the INMARSAT space segment, to the detriment of ships. This fear proved unfounded.

13. See Dann, *The INMARSAT System: Towards Full Global Coverage*, 6 SPACE COMM. & BROADCAST. 195, 198-99 (1988).

14. *Id.* at 201.

15. See von Noorden & Dann, *supra* note 1, at 4.

It was considered that communications to structures other than ships operating in the marine environment and land-based fixed services should both be offered on a secondary basis, but without a requirement that the Council should consider each application on a case-by-case basis. Article 7(2), as further revised, therefore, reads as follows:

The Council may permit access to the INMARSAT space segment by earth stations located on structures operating in the marine environment other than ships and by mobile earth stations at fixed locations on land, if and as long as the operation of such earth stations would not have a significantly adverse affect on the provision of mobile-satellite services.

It is unnecessary to discuss the remaining amendments which are of a minor nature and follow directly from the extension of the Organization's competence.

Competitive and Regulatory Issues

Remaining to be considered is the competitive and regulatory climate in which land-satellite communications will be offered. One issue of importance has already been mentioned: it will be for each country to decide whether INMARSAT's space segment may be used to offer land mobile-satellite services within its territory. The United States example is of interest. The Federal Communications Commission granted authority to the American Mobile Satellite Consortium (AMSC) to provide a domestic mobile-satellite service within the United States. For the time being, no other entity is authorized to provide a competing mobile-satellite service. This means that INMARSAT's U.S. Signatory is not permitted to provide land mobile-satellite services within the United States through the INMARSAT space segment. However, AMSC does not yet have a space segment of its own, and has therefore leased INMARSAT space segment capacity in order to provide its initial services. It is facing competition from the Qualcomm Corporation of California, whose "Omnitracs" system is able to provide land mobile-satellite services at Ku-band, that is to say, without using the frequencies specifically allocated to the mobile-satellite service. In addition, the Geostar Corporation has been given authority to provide a position-reporting service to mobiles within the U.S. The technology developed by Geostar allows short data messages to be sent with each position report, which enables the system to compete with AMSC in some of its markets. Geostar has also applied to introduce a new digital mobile satellite service which would compare directly with AMSC.¹⁶

16. Space Business News, June 27, 1988, at 6, col. 1.

Certain other countries, such as Canada and Australia, have announced firm intentions to construct their own domestic mobile-satellite systems, while others have made more tentative proposals. Each country must decide whether the volume of domestic traffic will be sufficient to justify the enormous cost of a dedicated domestic mobile-satellite system. For the majority of countries, shared use of the INMARSAT system may well be more attractive.

Nonetheless, there is a clear possibility that the land mobile market will be much more fragmented than the maritime and aeronautical markets. For this reason, a further amendment was proposed to the INMARSAT Convention, although it was not eventually adopted; this would have permitted INMARSAT to provide satellites or associated facilities separate from the INMARSAT space segment for land mobile-satellite communications. The provision of these separate satellites or facilities would be covered by contracts entered into between INMARSAT and the applicants concerned. Such a provision already exists in Article III(e) of the INTELSAT Agreement.

This proposal arose from a concern that those countries which establish their own mobile-satellite systems should not have to invest in that part of the INMARSAT space segment being used to provide land mobile-satellite communications for other countries. Although the proposal was not adopted, the Assembly decided, in January 1989, "to request the Director-General and the Council to report to a further Session of the Assembly on the question of whether there is a requirement for explicit authority in the Convention and Operating Agreement for the provision of separate space segment facilities."¹⁷ This matter will be further considered by the Assembly at its next regular Session, in October 1989.

In January 1989, the Assembly also asked the Director General to request INMARSAT Parties to provide appropriate information about their domestic laws, regulations and policies relating to the use of land mobile-satellite communications, and to bring this information to the attention of a future session of the Assembly.¹⁸ This survey is at present being undertaken by the Director General. The object is to obtain information about regulatory issues, such as the extent of permitted competition in land mobile-satellite communications as well as to discover what domestic laws and regulations affect the use of mobile earth stations in each country. One of the main advantages of mobile-satellite communications is that they are available almost without geographical limit. This is potentially of great advantage, for example, to the operators of a truck traveling from England to Turkey. However, such a truck will pass through several countries en route. There may be customs barriers to the importation of a mobile earth station into a country even if it is fitted to a

17. ASSEMBLY/6/REPORT, para 4.3.2.

18. *Id.*

vehicle and is imported only temporarily. The use of the mobile earth station may be dependent on type approval of the particular model by the relevant national authorities. Its use will also be subject to obtaining an operating license from the relevant authorities, unless the radio license issued in the country of origin is recognized for this purpose.

The failure of countries to modify and, where necessary, harmonize their national laws in these respects will constitute a major barrier to realizing the full benefits of land mobile-satellite communications. It is likely that such problems will be tackled first on a regional basis. The European Commission, for example, is in the process of formulating a policy on satellite telecommunications which may address these issues. It should be noted that, even within the European Community, there are at present no rules relating to mobile earth stations which require mutual recognition of type approval or of radio operating licenses.

Therefore, the recent amendments to the INMARSAT Convention provide a satisfactory international legal framework for the provision of land mobile-satellite communications. This development, however, has presented a new challenge to domestic law makers and regulators.

IMPLICATIONS OF COMMERCIAL ACTIVITIES IN OUTER SPACE, ESPECIALLY FOR THE DEVELOPING COUNTRIES

I. H. Ph. Diederiks-Verschoor*

As the conquest of outer space continues and steadily advances, commercial activities in the new world are multiplying. It is useful to review the results achieved so far and to take stock of the present situation. This is particularly relevant in relation to the developing countries, whose position has given rise to some concern and even anxiety in certain quarters.

Dr. Rao, in a speech during the Congress of the International Astronautical Federation in Bangalore in 1988, touched upon the vast problems facing the developing world when he said: "The existence and development of the humankind on the planet earth are inextricably linked to the earth's environment," adding that the problem was compounded in view of the growing world population, of which 80% is living in developing countries.¹ Participation in space technology may offer a solution, or at least a partial solution, to those problems.

As things are at present, operations in outer space are carried out by only a handful of developed countries, possessing a virtual monopoly in this field; they alone have the means for launching and transporting; they alone have the financial potential required for the huge investments. The developing countries, on the other hand, do not generally have sufficient means to engage in research and development, let alone for application purposes. Having said this, I must qualify this generalization somewhat by pointing out that a distinction is to be made here between very poor countries, like Bangladesh, and countries which already enjoy a more advanced state of development, such as India and Indonesia.

The situation roughly sketched in the previous paragraph has developed against the background of Article I, paragraph 1 of the Outer Space Treaty of 1967.² That fundamental rule of space law states that "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, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."

* President, International Institute of Space Law, International Astronautical Federation.

1. Rao, *Space Technology as an Instrument for Combating Environmental Problems, Particularly those of Developing Countries*, Invited lecture at the Cong. Int. Astronautical Fed., Bangalore, India, 1988.

2. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, art. I, para. 1, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 20 (hereinafter "Outer Space Treaty," or "Space Treaty").

Seen in the light of this basic principle of law, there would indeed, on the face of it, be a case for legitimate concern for a considerable number of Third World countries, who feel that they are lagging behind in current developments and might also miss out on opportunities for the future.

What can be done to remedy this state of affairs?

There are several areas of space operations that would greatly benefit the developing countries and in which they should all be able to share and participate. First and foremost, there are the telecommunication services, which would be direct, fast and cheaper than the traditional means of communication. Such services are vital for the business and education sectors, for general information of the public and for safety and progress. Secondly, there are the remote sensing operations, also an issue of key importance to the Third World.³ Thirdly, it would be most desirable to get the developing countries more actively involved in the protection of the environment. I will now elaborate on these three themes.

Telecommunications

The term "telecommunication" is defined in Annex 2 of the International Telecommunication Union (ITU) Convention as: "[a]ny transmission, emission or reception of signs, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems."⁴ Membership of the ITU is open to all countries. There are 163 member states.

Most international satellite communications are carried out by multi-administration organizations. On the international level, the most important of these Common User Organizations (CUO's) is INTELSAT, an international commercial cooperative of 115 member nations, that owns and operates a global communications satellite system, used worldwide by countries for their international, and in many instances, their domestic communications. The INTELSAT organization, which at this moment serves 170 countries, was established in accordance with the United Nations General Assembly Resolution 1721 (1961), in which the General Assembly expressed its belief that communications by means of satellite should be available to nations of the world as soon as practicable on a global and non-discriminatory basis.⁵ The aim of INTELSAT is to achieve a global commercial telecommunications satellite system to provide, for the benefit of mankind, the most efficient and economical facilities possible, consistent with the best and most equitable use of the radio frequency spectrum and orbital space. The Statutes of INTELSAT were adopted on May

3. It should be noted here that it is already to some extent involved in the activities via the LANDSAT Agreements. See note 29 below and preceding text.

4. International Telecommunication Convention (Malaga-Torremolinos), Annex II, Oct. 25, 1973, 28 U.S.T. 2459, T.I.A.S. No. 8572.

5. U.N.G.A. Res. 1721 (XVI) (1961).

21, 1971. INTELSAT has its headquarters in Washington and has a legal personality.⁶ As the goal of INTELSAT is to achieve a single global commercial telecommunications system, its members are committed to consulting INTELSAT when establishing, acquiring or using a satellite system separate from the INTELSAT system.

INTELSAT is a new form of international organization because its structure reflects the aim of INTELSAT to provide a global telecommunications system on a commercial basis. Its structure can be divided into two parts: first, the INTELSAT Agreement⁷ in which the intergovernmental participation is reflected in voting procedures based on sovereign equality of its member states, and second, the INTELSAT Operating Agreement,⁸ which covers the commercial aspects of the organization and where decisionmaking is based on the commercial interests of the parties in the form of weight voting in accordance with the capital contributions of the various members.

It is most important that developing countries should be members of INTELSAT to avail themselves of the opportunities this organization offers. In this respect, I would like to stress the requirement of a uniform tariff policy.⁹

The International Telecommunication Union regulates how and where requests for registration of the frequencies are to be lodged. All countries have the right to use frequencies and to place their satellites in a position in the geostationary orbit (GSO). The GSO is generally recognized as the best place for certain types of satellite activities. In the beginning, the principle of "first come, first served" has been applied but, as Dr. Jakhu puts it rightly: "[t]he right of priority had, however, never been expressly recognized in the ITU Convention or regulations and hence, was not legally binding."¹⁰ But already in 1977, this principle has been abandoned for the broadcasting satellites services. In 1982, during the Second U.N. Space Conference, the Group of 77 developing countries urged the conference to provide for more opportunities for taking part in space activities. The involvement of the developing countries in such activities was recognized by the U.N. Legal Sub-Committee on Outer Space, which met

6. Headquarters Agreement Between the Government of the United States of America and the International Telecommunications Satellite Organization (INTELSAT), Nov. 24, 1976, U.S.T. 2248, T.I.A.S. No. 8542.

7. International Telecommunications Satellite Organization (INTELSAT) Agreement, with Annexes, Aug. 20, 1971, 23 U.S.T. 3813, T.I.A.S. No. 7532.

8. Operating Agreement Relating to the International Telecommunications Satellite Organization (INTELSAT), Aug. 20, 1971, 23 U.S.T. 4091, T.I.A.S. No. 7532.

9. See *Id.* at Art. V (d) and the comments of H.L. VAN TRAA-ENGELMAN, COMMERCIAL UTILIZATION OF OUTER SPACE - LEGAL ASPECTS 89 (1989).

10. Jakhu, *The Evolution of the ITU's Regulatory Regime Governing Space Radiocommunication Services and the Geostationary Satellite Orbit*, 8 ANNALS AIR & SPACE L. 381, 394 (1983). See also Doyle, *Space Law and the Geostationary Orbit: The ITU's WARC-ORB 85-88 Concluded*, 17 J. SPACE L. 13, 21 (1989).

in Geneva, from March 14 to 31, 1988, and the Sub-Committee decided to add a new item to its agenda. After many discussions, a compromise was found in the following, rather complicated, text:

Consideration of the legal aspects related to the application of the principle that the exploration and utilization of outer space should be carried out for the benefit and in the interests of all States, taking into particular account the needs of the developing countries.¹¹

What it is all about, in matters of telecommunications, is equitable access for all countries to a position in the GSO.

The ITU has discussed the access issue during several important conferences, called World Administrative Radio Conferences (WARCs) held in 1971, 1977, 1983, 1985, 1987 and in August, 1988, respectively. The WARC-ORB-2 Conference, held in August 1988, had on its agenda planning principles, planning methods and procedural guidelines. It is important to remember that prior to this WARC-ORB only the Broadcasting Satellite Services had been arranged through ITU planning (*a priori*).

After WARC-ORB 1988, it has become clear that all services, including the important Fixed Satellite Service (FSS), will be arranged by the Dual Planning Method which is comprised of an Allotment Plan (an allotment for each country), plus Improved Procedures for requirements beyond the Allotment Plan. The Improved Procedures provide for the planning of satellite services by multilateral deliberation occurring at a Multilateral Planning Meeting (MPM). This author is unfamiliar with the criteria the MPM will use for the allotments but, in general, it can be said that since the beginning of space regulation there has been a move from "first come, first served" towards *a priori* planning, because the GSO is in danger of becoming "full," and because of increasing Third World pressure. A second issue is the status within the ITU of Common User Organizations, like INTELSAT, in connection with frequency allotment. Until now INTELSAT has only had observer status.

Discussions have included an *a priori* planning on the basis of equitable access. As Dr. Jakhu observes:

[i]t is important to note that this decision was taken on the initiation and insistence of those ITU member states (mostly the developing countries) which felt that some developed countries were monopolizing the use of the spectrum/orbit resource, and that if the existing practice of "first come, first served" continued to apply to the distribution of radio frequencies and orbital positions for space services, there

11. Report of the Legal Sub-Committee on the Work of its 27th Session, 14-31 March 1988: Committee on the Peaceful Uses of Outer Space, U.N.Doc. A/AC.105/411, at 10-11.

would not be sufficient and appropriate radio frequencies/orbital positions left for them when they were ready to use them.¹²

In the U.N. Legal Sub-Committee, where the special status of the geostationary orbit has been discussed for some years, Indonesia plays an important and useful conciliatory role between the equatorial countries, who feel that sovereignty, as recognized in law, extends without upper limits, and other States, who do not recognize sovereignty in space, basing their position on Article I of the Space Treaty of 1967.¹³ Prof. Priyatna Abdurrasyid rightly mentions that

[b]asically, it has turned out that the Declaration adopted by the equatorial nations in Bogota in 1976 has become one of the prime-movers for a comprehensive review by the international community with regard to the utilization of GSO for various purposes. Although the Declaration has come up in the shape of a demand launched by the equatorial countries claiming their sovereignty over the GSO which is situated above their respective territories, but it has turned out that its development in the international arena has come to nothing but a mere protest against the procedures regulating the utilization of the GSO under the principle of "first come, first served."¹⁴

For the time being, provision of satellite communications is the only substantial commercial use of outer space. Use of the GSO for telecommunications comprises a substantial part. Communication via satellite represents a significant economic activity in the order of \$2 billion per year, with projections reaching \$10 billion by 1990.¹⁵

Private ownership and operation of satellites for domestic use have existed for many years in the United States. At present structural changes in the domestic market of the United States are bringing a competitive environment to the international facilities market place.

12. Jakhu, *supra* note 10, at 407.

13. Article I of the Outer Space Treaty states: "[t]he 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, irrespective of their degree of economic or scientific development, and shall be the province of mankind" Outer Space Treaty, *supra* note 2. For a text of the Dec. 3, 1976, Bogota Declaration, see C.Q. CHRISTOL, *THE MODERN INTERNATIONAL LAW OF OUTER SPACE* 891 (1982).

14. Priyatna, *Developing Countries and Use of the Geostationary Orbit*, 30 *PROC. COLLOQ. L. OUTER SPACE* 375, 377 (1987).

15. *Current and Future State of Space Technology*, U.N. Doc. A/Conf.101/BP2, at 16 (1981).

The PANAMSAT satellite was the first to be launched of a group of private international systems licensed by the U.S. Federal Communications Commission.^{15a} In 1984, the President of the United States declared that these systems are required in the national interest of the United States.^{15b} The operators have to fulfill certain criteria prior to offering international services. One of these is the requirement that the space segment is offered on a long term contract for communications not interconnected with the public switched message network. A second is the requirement that the operator coordinate the system with INTELSAT through the United States signatory COMSAT and the signatory of a foreign partner in order to ensure that separate systems are technically compatible and will not cause significant economic harm to INTELSAT.

Having fulfilled these requirements, PANAMSAT acquired access to Peru, Costa Rica, the Dominican Republic, the United Kingdom, the Federal Republic of Germany, Ireland, France, Sweden and Luxembourg.¹⁶

Satellites are placed in outer space and, therefore, governed by the principles of space law. The fact that telecommunications satellites are used for earth-bound activities does not take them out of the regime of space law.

Remote Sensing

Concerning remote sensing: special phenomena such as desertification, deforestation, floods, drought, locusts, *etc.*, can be tracked more easily through detection by satellites.¹⁷

On December 11, 1986, the U.N. General Assembly unanimously adopted a resolution which contained 15 principles on remote sensing.¹⁸ This prompted Dr. Kopal to characterize the event as follows:

The achievement of a fair balance between the interests of the sensing States, *i.e.*, States possessing the necessary space capabilities, and the needs of the sensed States, many of them developing countries, should be considered as the most important compromise that paved the way to the final adoption of this document.¹⁹

15a. *Satellite Systems Providing International Communication* (Report & Order), FCC 85-399, 50 Fed. Reg. 42266 (released Oct. 18, 1985).

15b. Memorandum from the President, 20 WEEKLY COMP. PRES. DOC. 1853 (Nov. 28, 1984).

16. See Van der Heyden, *A New Approach for Satellite Communications in Europe - A Policy Proposal*, report prepared for E.S.A. Doc. HKC/ESA/203, at 9-10 (1989).

17. Rao, *supra* note 1.

18. Principles Relating to Remote Sensing of the Earth From Outer Space, U.N. Doc. A/Res/41/65 (1987) [hereinafter "Principles"].

19. Kopal, *Some Issues of the Next Progressive Development of International Space Law*, 31 PROC. COLLOQ. L. OUTER SPACE 297, 299 (1989).

I would like to put a special emphasis on some of the principles of the U.N. Resolution on remote sensing, namely Principle II, Principle IV, Principle X and Principle XI.²⁰ In Principle IV, the term "detrimental" is important. The last sentence of this principle states: "[s]uch activities shall not be conducted in a manner detrimental to the legitimate rights and interests of the sensed State."²¹ Consequently, the rights of the sensed state are guaranteed by this Resolution.

In Principle XII, it is desirable to notice that the sensed State shall have access to the primary data and the processed data of its territory on a "non-discriminatory basis" and on "reasonable cost terms."²² This is an important statement for the developing states. As Dr. van Traa-Engelman observes rightly: "[m]oreover, the addition of the word 'cost' in the term 'on reasonable cost terms' represented another indication of a more commercially orientated approach."²³

Although the construction of space stations requires a more advanced technological development, nevertheless it would be worthwhile trying to involve developing states in activities on earth regarding remote sensing originating from space stations. States are tending more and more towards international cooperation, an attitude from which the developing states could also benefit, when taking their responsibilities for a part of the activities. This is in accordance with Principle V, saying "[s]tates carrying out remote sensing activities shall promote international cooperation in these activities. To this end, they shall make available to other States opportunities for participation therein. Such participation shall be based in each case on equitable and mutually acceptable terms."²⁴

Although it has been argued by some nations that prior consent for remote sensing of a State should be sought, such protestations have never adversely affected operational progress. Principle XIII of the Resolution mentions prior "consultation" and not "prior consent." It is formulated as follows:

[t]o promote and intensify international cooperation, especially with regard to the needs of developing countries, a State carrying out remote sensing of the earth from space shall, upon request, enter into consultation with a State whose territory is sensed in order to make available

20. The text of Principle II states: "Remote sensing activities shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic, social or scientific and technological development, and taking into particular consideration the needs of the developing countries." Principles, *supra* note 18, at Principle II.

21. *Id.* at Principle IV.

22. *Id.* at Principle XII.

23. H.L. VAN TRAA-ENGELMAN, COMMERCIAL UTILIZATION OF OUTER SPACE - LEGAL ASPECTS 177 (1989).

24. See Principles, *supra* note 18, at Principle V.

opportunities for participation and enhance the mutual benefits to be derived therefrom.²⁵

Dr. Christol sums up the situation quite aptly by saying:

[c]onsensus could not be reached requiring *prior* consultation. It is clear, nonetheless, that a State considering that it is a likely subject of foreign remote sensing has a right, and without restriction, to request that consultations take place and that the requested State 'shall' enter into consultations with a State whose territory is sensed.²⁶

It stands to reason that it is very important for developing countries to get an opportunity to obtain all the details concerning their natural resources. As Prof. Myers rightly observes: "The Third World States are faced with serious problems, primarily because they do not possess the technology and means to conduct remote sensing. They must rely on the developed States to provide the data and to assist in the analysis."²⁷

To overcome these problems the so-called LANDSAT Agreements have been concluded.²⁸ They reflect a bilateral approach to regulate the organizational and legal implications of earth remote sensing activities. At the same time they may be seen as most valuable instruments involving the developing States in such operations, which are of such great benefit to them. More than eighty countries have used the U.S.A.'s LANDSAT remote sensing data.²⁹ In addition, the United Nations Development Program (UNDP) provides financial assistance for feasibility studies, fellowships and training allowances to developing countries. As regards Indo-Soviet cooperation in outer space activities, this has found a legal basis in an Intergovernmental Agreement of Further Economic and Trade Cooperation

25. *Id.* at Principle XIII.

26. Christol, *Remote Sensing and International Space Law*, 16 J. SPACE L. 21, 26-27 (1988).

27. Myers, *Third World Participation in Space Law Development*, 31 PROC. COLLOQ. L. OUTER SPACE 130 (1988).

28. *See e.g.* United States-Japan Memorandum of Understanding - Remote Sensing: Landsat system (MOU), July 13-30, 1981, 33 U.S.T., T.I.A.S. No. 10288. United States-Thailand M.O.U., May 9, 1979, 80 STAT 271, T.I.A.S. No. 10428. United States-South Africa M.O.U., Aug. 18 & Sept. 15, 1980, T.I.A.S. No. 10588. United States-Argentina M.O.U., Aug. 6 & Oct. 7, 1976, T.I.A.S. No. 10586. United States-Argentina M.O.U., Apr. 6, 1981, T.I.A.S. No. 10587.

29. For details, *see* LEGAL IMPLICATIONS OF REMOTE SENSING FROM OUTER SPACE 91-125 (N.M. Matte and H. DeSaussure ed. 1976).

of November 29, 1973, and in a number of interdepartmental agreements signed before and after the said Agreements.³⁰

In a very informative paper, Prof. Voute³¹ confirms that "the pricing policies resulting from remote sensing commercialization are being carefully scrutinized by the developing countries, faced as they are with budgetary constraints and scarcity of foreign exchange."³² What may be useful for those countries in this respect is the U.S. Remote Sensing Commercialization Act adopted in 1984.³³ This Act contains, amongst other matters, regulations on foreign payloads, provided they are launched from the U.S.A.³⁴

There are still other sectors in which the developing countries could become involved. Jasentuliyana and Ludwig point out that "one study had indicated that to add one solar power satellite in India would increase India's electrical capacity by 40%. But the costs would be enormous and this is what is hampering this idea."³⁵

Environmental Law

It is possible to make a distinction between preventing incidental natural disasters, which will have a direct character, and preserving the earth and the ozone layer by environmental survey and protection.

Principles X and XI of the U.N. Resolution on Remote Sensing refer to the environment. Principle X states

[r]emote sensing shall promote the protection of the Earth's natural environment.

To this end, States participating in remote sensing activities that have identified information in their possession that is capable of averting any phenomenon harmful to the Earth's natural environment shall disclose such information to States concerned.³⁶

Also, Principle XI is linking the use of remote sensing to natural disasters by asking the States to transmit all information which could be

30. For details, see V. VERESHCHETIN, E. VASILEVSKAYA, E. KAMENETSKAYA, *POLITICS AND LAW* 95 (1987).

31. C. Voute, *Some Consequences of the Commercialization of Satellite Remote Sensing*, 3 *SPACE POL'Y* 312 (1987).

32. *Id.*

33. United States Remote Sensing Commercialization Act of 1984, 15 U.S.C. sec. 4201 (1988).

34. Marshall, *Outer Space Commercialization in the U.S.A. - Effects on Space Law and Domestic Law*, 27 *PROC. COLLOQ. L. OUTER SPACE* 90ff. (1984).

35. 4 *SPACE SOLAR POWER REV.* 291-300 (1983).

36. See Principles, *supra* note 18, at Principle X.

useful in case of natural disasters or in case of impending natural disasters.³⁷

A review of Article III of the Outer Space Treaty indicates that it could also apply to the protection of the environment as it says:

States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding.³⁸

Also, Article IV clearly shows concern about the protection of the environment: "States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner."³⁹

But the fundamental rule, which is also the most directly applicable to environmental problems, is to be found in Article IX.⁴⁰ The aim of Article IX is to prevent the violation of natural equilibrium of space environment. Harmful contamination is to be avoided, and states shall, in case of violation, undertake appropriate measures after consultation. Now, consultation is a rather vague term, even if it is an internationally well-known mode of conduct. Two authors have written valuable articles on this term: Dr. Sztucki and Mrs. E. Galloway.⁴¹

Also, other treaty rules could be regarded as relevant to our subject. The Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, which was signed on August 5, 1963,⁴² must be kept in mind. Article 7 of the Moon Agreement of 1979 has amplified the rules laid down in Article IX of the Space Treaty of 1967:

[i]n exploring and using the moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise. States Parties shall also take measures to avoid

37. *Id.* at Principle XI.

38. Outer Space Treaty, *supra* note 2, at article III.

39. *Id.* at art. IV.

40. *Id.* at art. IX.

41. Sztucki, *International Consultations and Space Treaties*, 17 PROC. COLLOQ. L. OUTER SPACE 147 (1974); Galloway, *Consensus Decision-making by the United Nations Committee on The Peaceful Uses of Outer Space*, 7 J. SPACE L. 3 (1979).

42. Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water, Oct. 10, 1963, 14 U.S.T. 1313, T.I.A.S. No. 5433, 480 U.N.T.S. 43.

harmfully affecting the environment of the earth through the introduction of extra-terrestrial matter or otherwise.⁴³

In Article I of the Outer Space Treaty of 1967, space has been called "the province of mankind." Mr. Arzinger explains that "during the elaboration of the Moon Treaty there have been proposals to use only the term "province of all mankind," which was to replace the words 'common heritage'." ⁴⁴ At present both terms are in different articles of the Moon Agreement (Moon Treaty) with a different scope. It follows that they must have a different legal interpretation.

The "province of all mankind" is a general political moral principle of the execution of rights and duties in outer space. Its legal content is, according to Article I of the Outer Space Treaty, the international cooperation in exploration and use of outer space without discrimination of any state and the duty to take the interests of all other states into account. The legal contents of "common heritage" are much stricter, covering the exploitation of natural resources of the moon. The "common heritage" is mentioned in only Article XI of the draft of the Moon Agreement.⁴⁵ Article 11(5) says that "the States Parties to this Agreement 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."⁴⁶ Dr. Maiorski observes that "the Treaty of 1967 refers to the notion of province of all mankind to activities (exploration and use) and not to territories or objects."⁴⁷ He also states that both terms have in common the fact that neither of them can be applied to outer space as a whole.⁴⁸

What measures could be taken to prevent or limit damage caused to the environment?

The only way to control harmful activities is verification by remote sensing. The term "remote sensing" means the "sensing of the Earth's surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects, for the purpose of improving natural resources management, land use and the

43. For a text of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (hereinafter "Moon Agreement"), December 14, 1979, art. 7, see THE UNITED NATIONS TREATIES ON OUTER SPACE 27, at 30 (1984).

44. R. Arzinger, *Legal Aspects of the Common Heritage of Mankind*, 22 PROC. COLLO. L. OUTER SPACE 89 (1979).

45. Moon Agreement, *supra* note 43, at art. 11, para. 1.

46. *Id.* at para. 5.

47. See Maiorski, *Some Considerations on the Concepts of Common Heritage of Mankind and Province of All Mankind in International Space Law*, 29 PROC. COLLO. L. OUTER SPACE 134 (1986); see also Postyshev, *WARC-ORB 85 and the Common Heritage of Mankind Concept in Space Law*, 29 PROC. COLLO. L. OUTER SPACE 134 (1986).

48. Maiorski, *supra* note 47, at 134.

protection of the environment." 49 Dr. Bordunov thinks rightly that "the findings of space remote sensing can inarguably be instrumental in resolving the problems of international cooperation in the sphere of environmental protection." 50

When plans to establish an international regime of the resources of the moon will be realized, it could be desirable to involve the developing countries in it, for instance by using persons of these countries for work related to its exploitation. Finally, it will be necessary to find means for an efficient verification. Several proposals have been made in this respect.⁵¹ In the task of supervising, persons from developing countries could also be engaged. As Mr. Ekblad and Mr. Orhaug correctly observed,

[t]he objectives of an International Space Surveillance Agency (ISSA) could be manifold. Principal objectives should be the verification of various existing, and future, outer-space treaties (the registration convention, the use of outer space for peaceful purposes, non-militarization of outer space, etc.). There are also a number of related issues where the supervision of artificial satellites would be of great importance (e.g. the protection of decaying satellites).⁵²

Cooperation

Several forms of cooperation could further commercial activities for the whole world:

1. Regional cooperation between the developing countries themselves would be very desirable and has to be stimulated. There are already some examples of such cooperation. The Philippines and Malaysia already are using the Palapa satellites of Indonesia. Arabsat has been functioning since 1986, with the States joined together in the Arab League as members.

49. See Principles, *supra* note 14, at Principle I; see also Diederiks-Verschoor, *Current Issues in Remote Sensing, Regulation of Transnational Communications*, MICH. YB. INT. LEG. STUDIES 805 (1984).

50. Bordunov, *Remote Sensing of Earth and its Environment*, 23 PROC. COLLOQ. L. OUTER SPACE 1 (1980).

51. He, *Space Arms Control and International Verification*, in AN ARMS RACE IN OUTER SPACE: COULD TREATIES PREVENT IT? 119 (Centre for Research in Air & Space Law, 1985); Vlastic, *Verifying Compliance with Arms Control Agreements: Whatever Happened to "ISMA"?*, in I ARMS CONTROL AND DISARMAMENT IN OUTER SPACE 187 (Centre for Research of Air & Space Law, 1985); see also Kuskovelis, *Verification and the Space Related Agreements*, 28 PROC. COLLOQ. L. OUTER SPACE 61 (1985).

52. Ekblad & Orhaug, *Verification of Outer Space Treaties by an ISSA*, 31 PROC. COLLOQ. L. OUTER SPACE 22 (1988).

2. Cooperation between developing countries and developed countries also will be necessary, particularly joint endeavors, such as the LANDSAT Agreements.
3. Perhaps, as Prof. Vereshchetin and Dr. Kamenetskaya have observed, a world-wide space organization should be considered.⁵³

In conclusion, interest in space matters among the public at large has to be activated. Developing countries and countries already involved in space activities need to stimulate the peaceful and commercial use of outer space.

53. Vereshchetin & Kamenetskaya, *On the Way to a World Space Organization*, 12 ANNALS AIR & SPACE L. 337 (1987); Gaggero, *Developing Countries and Space*, 5 SPACE POL'Y 107-111 (1989).

ARTICLE I OF THE OUTER SPACE TREATY REVISITED

N. Jasentuliyana*

I. Introduction

Article I of the Outer Space Treaty of 1967¹ states that 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, irrespective of their degree of economic or scientific development, and shall be the province of all mankind." The language of this provision makes it clear that space exploration is not only a concern of a small number of States that actually carry out such activities, but of all States, including the developing countries.

This provision raises a number of issues in the relationship between developing and developed countries and the nature of international co-operation between States in outer space: What precisely is the nature of the obligation that is being placed on those States which conduct space activities and are parties to the Outer Space Treaty? To what degree are States obliged to co-operate and share information on their activities with other States? Should such co-operation be enforceable? Is there a need for a new international legal framework which would spell out the precise nature of such co-operation?

These questions have been addressed generally for more than three years in the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and its subsidiary body, the Legal Sub-Committee, and formally since 1988 under a new agenda item of the Legal Sub-Committee entitled "Consideration of the legal aspects related to the application of the principle that the exploration and utilization of outer space shall be carried out for the benefit and in the interests of all States, taking into particular account the needs of developing countries."

These discussions reveal dissatisfaction among many developing countries with the status of international co-operation under Article I of the Outer Space Treaty. Therefore, it is not surprising that some developing countries are hoping to legally "cement" the requirement for

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1. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967 (hereinafter cited as "Outer Space Treaty"), 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 20.

international space co-operation and not to let Article I of the Outer Space Treaty stand, in their view, merely as an artifact or a moral appeal to the space-faring countries. Therefore, these countries have called for a legal regime which would define the nature of such international space co-operation and stipulate the degree to which the "benefits" derived from space activities should be shared. A judicial system of enforcement might be a final goal. Not surprisingly, such calls have not elicited the sympathy of the space-faring countries such as France and the United States.

Earlier attempts by developing countries at defining more precisely States' responsibilities regarding international co-operation had been limited to one area of space activities, remote sensing, in which the Committee on the Peaceful Uses of Outer Space, following a decade-long discussion, agreed on a set of remote sensing principles which were subsequently adopted by the General Assembly in its resolution 41/65 in 1986. The remote sensing principles reaffirm Article I of the Outer Space Treaty and provide that "[s]tates carrying out remote sensing activities shall promote international co-operation." However, the only concrete requirement arises from the provision that a sensed State shall have access to remote sensing data of its territory.

This paper will begin with a review and assessment of recent discussions in the Committee and its Legal Sub-Committee concerning the introduction of the new agenda item relating to Article I of the Outer Space Treaty. In the final part of the paper, it will be argued that States' obligations towards international space co-operation under Article I of the Outer Space Treaty are difficult to enforce and constitute more a moral and philosophical obligation than a legal requirement. Discussions of Article I under the new agenda item of the Legal Sub-Committee will primarily serve the developing countries as a vehicle to draw attention to their concerns and to appeal to the moral consciousness of those States with substantive space activities to co-operate as much as possible with them. Any attempts beyond that, such as the codification of general legal obligations of international co-operation in space, will encounter strong resistance and do not at present seem feasible if Member States continue to accept the sensitive consensus structure of the Committee and its Legal Sub-Committee. Nonetheless, as the remote sensing principles indicate, it may be possible, in the long term, to negotiate specific rights and obligations in specific areas and thereby build up a body of principles of international cooperation.

II. Introduction of a New Item on Sharing of Outer Space Benefits in the Agenda of the Legal Sub-Committee of COPUOS

The Committee on the Peaceful Uses of Outer Space and its subsidiary bodies, the Scientific and Technical Sub-Committee and the Legal Sub-Committee, have a series of agenda items which specify the questions to be discussed. Since all decisions in the Committee and its

subsidiary bodies are made by consensus agreement among the Member States, the recommendation to add a new agenda item or to drop an item is also a matter of consensus. It should be borne in mind that the addition or deletion of an agenda item, particularly on the agenda of the Committee, is quite rare, and that it is the United Nations General Assembly which is the final authority on this matter.

Past practice has shown that there can be a variety of reasons for Member States to add a new item to the agenda of the Committee or its subsidiary bodies. One reason is the replacement of an agenda item by another, since the old item might have been discussed extensively, technological developments might have rendered its discussion irrelevant, or some legal guidelines or principles might have been adopted under the item. Another reason can be found in new technological developments in outer space which require the attention of the Committee and its subsidiary bodies, as was the case, for instance, with the addition of the item "Spin-off benefits of space technology: review of current status" to the agenda of the Committee in 1989² and the most recent proposal, to add an item on "space debris" to the agenda of the Scientific and Technical Sub-Committee.³ Furthermore, in the view of some States, political developments might necessitate the addition of an item, as was the case with the item "Ways and means of maintaining outer space for peaceful purposes," which originally had read "Questions relating to the militarization of outer space" and had been added to the Committee's agenda by the General Assembly in 1983⁴, not by consensus, however, but by vote, with the United States and most other Western States abstaining or voting against the resolution.

Recently, the question of a new agenda item for the Legal Sub-Committee arose in 1986, when work on the agenda item "Legal implications of remote sensing of the Earth from space, with the aim of finalizing the draft set of principles" was approaching its conclusion; after more than ten years of negotiation, a consensus had emerged in the Sub-Committee on a set of draft principles relating to remote sensing of the Earth from outer space, and it remained only for the text to be formally adopted by the General Assembly the same year. In that year, discussions on a possible new agenda item were taken up during the sessions of the Legal Sub-Committee and the Committee, which endorsed the idea of adding a new item to the agenda of the Legal Sub-Committee by agreeing that the Sub-Committee could take on "new tasks."⁵

With the adoption of the "Principles relating to remote sensing of the Earth from outer space" by the General Assembly in its resolution 41/65 of 3 December 1986, the number of items on the agenda of the Legal Sub-Committee had officially been reduced to two. It was now the task of

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2. U.N. Doc. A/RES/43/56, para. 21.
 3. U.N. Doc. A/44/20, paras. 32-34.
 4. U.N. Doc. A/RES/38/80, para. 15.
 5. U.N. Doc. A/41/20, para. 76.

the Committee and the Legal Sub-Committee to find a new agenda item, and all 53 Member States of the Committee were in agreement that the new item should be one which has reasonable prospects for consensus agreement.

1. *Proposals by the Group of 77 Member States*

Venezuela, at the 1986 session of the Committee on the Peaceful Uses of Outer Space, took the initiative by suggesting a new item entitled "Equitable access by States to the benefits derived from space technology."⁶ Venezuela had thereby, at a very early moment, set the stage for a series of proposals by the developing countries of the Group of 77 in the Committee, proposals which in substance would be very similar to that proposed by Venezuela.

A formal proposal put forth by Yugoslavia on behalf of the members of the Group of 77 in the Committee at its 1986 session was based on the proposal by Venezuela; it read: "Access by States to benefits of the exploration and uses of outer space." In the view of the Group of 77, this proposal met the concrete needs and expectations of all countries, particularly those of the developing countries, and would respond to the expectations aroused by the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space held in Vienna in 1982 (UNISPACE 82).⁷ The Committee gave official acknowledgement to this proposal by recommending that the Legal Sub-Committee at its 1987 session should "[c]onsider the choice of a new item for the agenda of the Legal Sub-Committee. . . , including the proposals made by the Group of 77 and others, . . ."⁸; this recommendation was subsequently endorsed by the General Assembly in its resolution 41/64 in 1986.

It was not until the 1987 session of the Legal Sub-Committee, however, that the Group of 77 presented an official working paper⁹ describing in more detail the nature of the proposal. In the working paper, the Group of 77 pointed out that various principles, such as those to be found in international law, the United Nations Charter, the Outer Space Treaty, and the conclusions of the UNISPACE 82 Conference, emphasized international co-operation as a key element "in activities undertaken by governmental, non-governmental and transnational entities in outer space."¹⁰ Such co-operation, the Group of 77 claimed, was linked to the development of relevant legal regulations. In particular, the Group of 77 mentioned several points which would need to be considered, such as the question of access by States to the benefits of space activities, the concepts of "benefits" and "interests" (Article I of the Outer Space Treaty), and the

6. U.N. Doc. A/AC.105/SR.282.

7. U.N. Doc. A/41/20, para. 85.

8. U.N. Doc. A/41/20, para. 75 (c).

9. U.N. Doc. A/AC.105/C.2/L.162.

10. *Id.* at para. 5.

mechanisms for the equitable distribution of the benefits of space exploration.

The working paper, however, did not spell out concrete goals or objectives of the proposal. Chile, a moving force behind the Group of 77 proposal, was more explicit in the debate during the Sub-Committee's session, arguing that "the time had come" to establish far-reaching and wide-ranging accords guaranteeing access for all countries to the benefits of space activities. Chile stated that the best course would be to draft legislation explicitly acknowledging the right of access to a share in the benefits of space activities.¹¹

The Legal Sub-Committee as well as the Committee and the General Assembly continued this debate in 1987, but without reaching agreement. It was only at the 1988 session of the Legal Sub-Committee that agreement was finally reached on the basis of a compromise proposal put forward by Austria over the initial objections of a number of States including Canada, France and some other Western European States, who argued that the wording of the new item, which closely followed the original proposal by the Group of 77, was not broad enough to reflect their wish to discuss in detail legal questions affecting the development of space activities.¹²

The Sub-Committee finally agreed that the new agenda item should read: "Consideration of the legal aspects related to the application of the principle that the exploration and utilization of outer space should be carried out for the benefit and in the interests of all States taking into particular account the needs of developing countries."¹³

2. *Proposals by Other Member States*

Besides the proposal put forward by the Group of 77, a number of other suggestions for the new agenda item were made by other States, including the following proposals: strengthening the application of the 1975 Convention on Registration of Objects Launched into Outer Space (Canada, France, Netherlands and Sweden); enhancement of co-operation between States in the event of accident or emergency on board a manned-space object endangering the lives or health of the crew (United Kingdom); and the legal status of a spacecraft crew, in particular with respect to the conditions governing manned-space flights (USSR). It was also proposed that some elements of the aforementioned proposals might be combined into a single agenda item entitled "Legal aspects of human presence, activities and co-operation in outer space" (Czechoslovakia).¹⁴

11. U.N. Doc. A/AC.105/C.2/SR.456.

12. U.N. Doc. A/AC.105/C.2/SR.496.

13. U.N. Doc. A/AC.105/411, paras. 41 and 48.

14. U.N. Doc. A/AC.105/385, para. 33.

3. *Consideration of the New Agenda Item at the 1989 Session of the Legal Sub-Committee*

Though the Legal Sub-Committee and the General Assembly had officially endorsed the new agenda item in 1988, the consensus achieved did not result in substantive discussions under the new item at the 1989 session of the Legal Sub-Committee. In fact, the debate became embroiled in procedural questions.

The discussion¹⁵ centered around two problems: first, the scope of subjects to be discussed under the rather vaguely worded new item; and second, the question of the establishment of a working group to consider the item in detail in the Sub-Committee, a matter which the General Assembly in its resolution 43/56 had asked the Sub-Committee to finalize, since the Assembly had not been able to arrive at a consensus decision on this matter in 1988.

Concerning the scope of subjects to be discussed under the new item, the Sub-Committee had before it the replies of twelve Member States in response to a note verbale sent out by the Secretary-General asking for Member States' views as to the priority of specific subjects to be discussed under the new item.¹⁶ The replies received from developed and developing countries reflected a wide spectrum of views.

In the debate during the 1988 session, the United States expressed the view that the scope of subjects to be discussed under the new item should basically be confined to consideration of national legislation in respect to Article I of the Outer Space Treaty of 1967. Several members of the Group of 77 objected to this narrow scope with the argument that very few States had such national laws. They wished to discuss a new international legal framework enhancing co-operation to ensure a better distribution of scientific and technical knowledge to the developing countries. However, the Group of 77 was not at all united on the specific details of their proposal. While Brazil preferred not to discuss national legislation, Chile argued that such a discussion could serve as a valuable basis from which to proceed, Argentina felt that national legislation might perhaps be an acceptable first step. These differing views on substance and procedure among the members of the Group of 77, particularly among the Latin American Group, may have impeded the persuasiveness of the Group and made it more difficult for the Group of 77 to obtain agreement on the particular concerns it wanted to see addressed under the new item.

The Soviet Union sought to link the new item with an existing Soviet proposal, looking for support from the members of the Group of 77 and supporting the Group of 77 view that the benefits of space activities should

15. U.N. Doc. A/AC.105/C.2/SR.519-524.

16. U.N. Doc. A/AC.105/C.2/15/Add. 1-6.

be widely shared. The proposal that the USSR had in mind was the establishment of a world space organization¹⁷ which, in its view, should be discussed under the new item.

Concerning the establishment of a working group to consider the item in detail, the question was whether and when a working group was to be convened under the new item. The establishment of a working group is a matter of importance because it is the practice of the Legal Sub-Committee to establish a working group as soon as it is ready to discuss in detail any item on its agenda, and the establishment of a working group normally leads to the consideration of texts proposed for adoption as legal principles or treaties.

The Group of 77 as well as all of the Eastern European countries called for such a working group to be established in order to facilitate the work of the Sub-Committee under the new item, some of them insisting that it be convened during the 1988 session of the Sub-Committee. While the United States in the past had resolutely been opposed to such a working group, it repeated the argument contained in its reply to the Secretary-General's note verbale in which it had softened its position by accepting the establishment of such a working group at a later stage, possibly in 1991, but upon certain pre-conditions. Some of the Western States, in particular, the Federal Republic of Germany and the United Kingdom, did not object to the establishment of a working group *per se* but wished to have its mandate defined before it was convened; France explained it would not oppose its establishment.

A compromise proposal put forward by Austria broke the impasse and tied the two problems together in a "package" solution. A consensus was reached that a note verbale would be sent in 1989 to Member States asking for their views on international agreements relevant to the subject under review, that, in 1990, the Sub-Committee would discuss national legislation, and that a working group would be established in 1991.¹⁸

Though the Austrian compromise proposal sets up a clear timetable for the establishment of a working group, it purposely leaves open the question of what precisely is to be discussed under the new item. This lack of clarity might pose problems at future sessions of the Sub-Committee and might delay substantive discussions.

There is no doubt that the Austrian compromise proposal was adopted by consensus because all sides in the Sub-Committee gained from it and had to make concessions. The Group of 77 and the Eastern European Group received an explicit commitment of the Sub-Committee to the establishment of a working group in 1991, though they were not able to have it convened earlier. The United States was able to have the Sub-Committee discuss national legislation under the new item prior to

17. U.N. Doc. A/AC.105/L.171.

18. U.N. Doc. A/AC.105/430, para. 53.

undertaking more specific and detailed work on the subject but had to agree to the establishment of a working group without pre-conditions.

4. *Evaluation of Proposals and Debate*

If one considers the time it took the Committee and its subsidiary bodies to conclude their discussions on finding a new agenda item for the Legal Sub-Committee, it becomes clear how difficult and arduous such a decision has become. Even in 1989 no substantive discussions had taken place on the new item in the Legal Sub-Committee but were postponed until 1990. Since the issue of a new agenda item was first raised at the 1986 session of the Legal Sub-Committee, four years will have passed in 1990 when the Legal Sub-Committee actually begins substantive debate under the new item.

One reason for this decision-making process being so slow is the consensus structure in the Committee. Since there is agreement that decisions should not be taken by vote, a considerable amount of time is spent on informal negotiations trying to iron out the differences among Member States. Another reason has to do with the fact that the Group of 77 took an unprecedented interest in proposing a new item for consideration and insisting on its acceptance, and the decision-making process within the Group of 77 is as time-consuming and difficult as the process among all Member States of the Committee.

In order to better understand the reasons why Venezuela, a member of the Group of 77, proposed the question of access to the benefits of space technology for the new agenda item, it is necessary to recall the apparent dissatisfaction of the developing countries over the final conclusion of the "Principles relating to remote sensing of the Earth from outer space," which were adopted by the General Assembly in 1986. It had become clear during the many years of discussion on the draft principles in the Committee and the Legal Sub-Committee that the space-faring States, in particular the Western countries, were unwilling to establish any legally binding regulations on States' responsibilities regarding the exchange of remote sensing data and information beyond the right of a sensed State to access.

Principle II, for example, though it provides that remote sensing activities shall be carried out for the benefit and in the interests of all countries--a formulation taken from Article I of the Outer Space Treaty--does not contain any more specific obligations, as the members of the Group of 77 would like to see, to give substance to this general principle. Furthermore, at the final adoption of the principles by the General Assembly in 1986, most of the space-faring countries confirmed the suspicions of many developing countries by stating explicitly that, in their view, the remote sensing principles, as a General Assembly resolution, were not legally binding but were to be interpreted as general guidelines on the matter.

One member of the Group of 77, Algeria, referred to this situation in a statement during the 1986 session of the General Assembly's Special Political Committee when discussing the outer space item. Algeria said that the draft principles relating to remote sensing in no way had met the needs of the developing countries or respected the rights of the sensed State. His delegation wondered how a developing country affected by a remote sensing programme might be assured of obtaining information concerning the programme if one of the principles contained the restriction that such information was to be transmitted to the "greatest extent feasible and practicable." For that reason, Algeria stated, it supported the adoption of a new agenda item similar to the one proposed by Venezuela.¹⁹

A reason for Venezuela to propose a broadly worded agenda item might have been its realization that only such a rather vague item could obtain the solid support of the Group of 77 and acceptance by consensus in the Committee. Also, it would leave open the chance for all sides in the Committee to discuss whatever topics they wished.

Furthermore, any item dealing with specific legal aspects of space exploration puts most developing countries at a disadvantage as they, in contrast to the developed countries, generally do not possess specialized legal expertise in the field of outer space and are not in a position to send legal experts from their countries to take part in the debates in the Legal Sub-Committee. For this reason, they were not in a position to put forward a well-articulated proposal reflecting their concerns. Though it is known that Venezuela initially did wish to make a more specific proposal in draft treaty form, it did not receive the support of even the Latin-American group, in which the matter was first discussed prior to consideration in the Group of 77 as a whole.

Ultimately, it was only this broadly worded agenda item which allowed the Group of 77 to take up the subject matter of international co-operation and the sharing of the "benefits" of space exploration; the more specific the proposal, the lesser the chance of having such a delicate subject matter discussed at all.

It is in this sense then that the vagueness of the item allowed the Group of 77 to push for their concerns without having to specify their final objectives. Recent discussions in the Committee on the Peaceful Uses of Outer Space, in June 1989, revealed that more and more developing countries in the Committee wish to go beyond the mere consideration of the status of international space co-operation under Article I of the Outer Space Treaty as spelled out in the Group's 1987 working paper.²⁰ Some delegations have now clearly expressed their general goal under the new agenda item by stating that technological differences among States had brought about inequalities in the benefits derived from space activities.

19. U.N. Doc. A/SPC/41/SR.35.

20. U.N. Doc. A/AC.105/C.2/L.162.

Therefore, a set of legal principles needed to be elaborated with a view to institutionalizing international co-operation.²¹

On the other hand, the vagueness of the agenda item also hurt the chances of the developing countries to have a substantive discussion under the item as soon as they wished to. The floodgates have been opened for almost any subject matter to be discussed, ranging from the pending proposal for the establishment of a new international space agency to proposals concerning streamlining the methods of work in the Sub-Committee.

One ambiguity in the text of the new item is the meaning of the last phrase, "taking into particular account the needs of developing countries," which raises some interesting questions. Article I paragraph I of the Outer Space Treaty states that "the exploration and utilization of outer space should be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development" The phrase "taking into particular account the needs of developing countries" does not appear anywhere in the Treaty. The insertion of this new phrase could be interpreted in several ways: first, it may represent an attempt to establish a particular, and arguably new, meaning to Article I; second, "the principle" might refer to a new principle, related to but not identical with Article I; and third, the new phrase might be taken to refer, not to Article I itself, but rather to "consideration" of Article I under the new agenda item. Discussion of the application of "the principle" may, therefore, involve a difficult discussion of precisely what principle it is that is to be applied.

III. *Article I of the Outer Space Treaty in the Context of the New Agenda Item*

In order to better understand the differing views among the Group of 77 countries in the Committee and those of the space-faring States on the matter of access to the benefits of space technology, which is ultimately a question of the nature of international co-operation among States, it is necessary to look at Article I, paragraph I of the Outer Space Treaty of 1967, since it serves as the basis for the claims of the Group of 77 proposal. This provision sets forth limitations and obligations to the exploration and use of outer space by stating that such activities should be carried out "for the benefit" and "in the interests" of all countries.

1. *The Objective of Article I: Space Exploration "for the benefit" and "in the interests" of All Countries*

The Outer Space Treaty established the freedom to explore and use outer space as well as a series of other rights and obligations. But such

21. U.N. Doc. A/44/20, para. 106.

rights are conditional upon the important limitation under Article I, paragraph 1 of the Treaty that provides that the benefits of such exploration and use shall accrue to all countries. Under this provision, countries shall benefit "irrespective of their degree of economic or scientific development." This implied reference to developing countries, which was originally included in the text of the Soviet draft as a preamble, was embodied in Article I, paragraph 1 on a proposal by Brazil supported by several other developing and socialist countries (Egypt, India, Czechoslovakia and Hungary among others)²² who insisted that it be part of the binding treaty commitment.

Article I, paragraph 1 of the Outer Space Treaty has its roots in an earlier agreement, the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, which was adopted by the General Assembly in its resolution 1962 (XVIII) of 13 December 1963. In that resolution, the General Assembly expressed its belief that the exploration and use of outer space should be carried out for the betterment of mankind and for the benefit of States irrespective of their degree of economic or scientific development. Furthermore, States should be guided by the principle of co-operation and mutual assistance and should conduct all their activities in outer space with due regard for the corresponding interests of other States.

The objective of Article I and of the Declaration, which first set forth the principle that became legally enshrined in the Outer Space Treaty seems quite clear: by calling attention to the essential needs of mankind and emphasizing the importance of co-operation, the objective was to require States to co-operate internationally in their space ventures. What is not clear, however, is the extent of obligation involved.

During the hearings held by the United States Senate Foreign Relations Committee prior to Senate approval of the Treaty, Ambassador Arthur Goldberg, the chief United States negotiator of the Treaty, responding to a question as to whether, under Article I, the United States would be required to make its communication satellites, including those for defense communications, available for the benefit of all countries, stated that Article I is a statement of general goals, and that separate international agreements would be required to cover the use of particular satellites.²³ The legal opinion submitted by the United States Department of State to the same hearings stated that "Art. I para. 1 does not undertake to set any terms or conditions on which international co-operation would take place."²⁴ The Committee nevertheless attached an understanding in its report to the effect that "[i]t is the understanding of the Committee on Foreign Relations that nothing in Article I paragraph 1 of the Treaty

22. U.N. Doc. A/AC.105/C.2/SR.62; SR.63, at 7, 9; SR.64, at 4, 7, 9; SR.71, at 22.

23. Treaty on Outer Space: Hearings Before the Senate Committee on Foreign Relations, 90th Cong., 1st Sess. 1, 33 (1967).

24. *Id.* at 53.

diminishes or alters the right of the United States to determine how it shares the benefits and results of its space activities."²⁵

The United States view is shared by the Soviet Union, as indicated by the Soviet delegate to COPUOS, Yuri Kolosov, when he stated that "the principle of international cooperation in exploring and using outer space for peaceful purposes is given body through the conclusion of specialized treaties by States and international organizations. This is understandable, since the character and degree of participation of States in international space projects depend, ultimately, on their will."²⁶

While major space powers had thus delimited their obligations to co-operate under the Treaty, as a practical matter no State has asserted claims under the Treaty to results obtained by another country through its space activities, no doubt due in part to the fact that benefits of space activities have often been shared by countries either voluntarily or under other existing agreements.

Exploration and use of outer space and the celestial bodies, being the "province of all mankind," were not meant to serve only the interests of those States which have the technological capability to explore and utilize outer space but all States. The rights of States without space capabilities are secured through the stipulation in the Outer Space Treaty that space exploration and use are to be conducted "for the benefit" and "in the interests" of all countries. Such a limitation on the activities of the space-faring States is meant to promote international co-operation among all States. A spirit of international co-operation prevails where the "benefits" derived from space exploration are available to all those States incapable of conducting their own activities in outer space. The term "benefits" would appear to be all-inclusive and relate to any kind of information or results obtained which have some usefulness for Earth-oriented applications.

In summary, the underlying essence of Article I is reflected in its appeal to all States of the world to co-operate internationally in their space ventures. While there is no question of the need to conduct space activities in such a spirit, the very general wording of Article I leaves a lot of room for interpretation. What is the obligatory nature of this provision? To what extent and by what means are States to co-operate "for the benefit" and "in the interests" of all States?

2. *The Obligatory Nature of Article I, Paragraph 1*

Article I, paragraph 1 is formulated rather vaguely and could give the impression that it was meant to lay down only a general principle with no legally binding force. In fact, some Western scholars have felt that the

25. *Id.* at 74.

26. G. ZHUKOV & Y. KOLOSOV, INTERNATIONAL SPACE LAW 77 (1984).

Treaty stopped short of a legal obligation.²⁷ It is commonly accepted, however, among the community of States which conduct space activities that they have a general obligation to co-operate in one way or another when carrying out their space activities.

The question of international co-operation has become further complicated by the fact it is no longer only States which carry out space activities but also private corporations with commercial purposes, over which States often do not exercise strict regulatory control. Such commercialization, in the view of some, would threaten the interests of developing countries in partaking of the benefits of space exploration since commercial interests may not always square with public interests for international space co-operation. Though there exists a certain degree of obligation on the part of States to set regulatory standards for private enterprises on promoting international co-operation by private enterprises, the difficulty remains as to how far a State's responsibility should be exercised and whether it will be in a position or even willing to actually enforce the requirement for such co-operation.

Another difficulty arises from the fact that there is no judicial or other authority or standard by which to judge whether the general principle for carrying out space activities in a co-operative spirit is actually being followed by States or not. If one State, in the opinion of another, violates its responsibilities under the Treaty by not sharing all the information and data available to it, what remedy does the other State have?

These are the kind of questions that the developing countries wish to address in their desire to establish a legal regime specifying the precise nature of such international co-operation under the new agenda item for the Legal Sub-Committee. It touches ultimately at a core-problem in the relationship between developed and developing countries which is also debated in many other fora in the United Nations: how to narrow the technological know-how gap between the developed and developing countries? In fact, such discussions have very much influenced and perhaps even been the source of the discussions concerning the new item in the Legal Sub-Committee.

IV. *Future Perspectives*

In the view of the developing countries, the new item on the agenda of the Legal Sub-Committee not only gives them the opportunity to publicly put to a test the commitment of the space-faring States to co-operate in outer space. More importantly, it provides the opportunity for them to

27. Cheng, *Nineteen Hundred and Sixty Seven Space Treaty*, 95 J. DROIT INT'L 532 (1968); Goedhuis, *Some Legal Problems Arising from the Utilization of Outer Space*, in INTERNATIONAL LAW ASSOCIATION REPORT OF THE 54TH CONFERENCE, The Hague, Aug. 23-29, 1970, at 434 (1971).

seek further progress on the matter, i.e., towards the establishment of a legal framework on international space co-operation.

Though many reasons have been advanced by developing countries during the discussions in the United Nations bodies dealing with space activities to explain their discontent with the present commitment of space-faring States to international co-operation under the provisions of the Outer Space Treaty, in essence, they are saying that they believe that the technological gap between the developed and the developing countries is widening and that they wish to reverse the trend at least to some degree by sharing the benefits of space activities.

While there is no doubt that all States who conduct space activities are willing to co-operate and share information, it seems as if the developing countries have arrived at the conclusion that these States have not gone far enough in their co-operation. It also seems as if more and more of the developing countries have lost their confidence in moral appeals as embodied in the spirit of Article I of the Outer Space Treaty. They increasingly seem to believe that the remedy to the situation lies with the establishment of an international legal framework regulating space co-operation and requiring the developed countries to co-operate within specified limits.

The call for the establishment of a legal order that would regulate international space co-operation may become increasingly stronger and should, therefore, not be brushed aside as a temporary development. Therefore, it seems logical to discuss the prospects for such a legal order by addressing several problem areas. There is, first, the question as to what such a legal regime should specifically entail. Second, there is the problem of whether it should provide a system of enforcement in case the provisions of the legal framework are not met. And third, there is the question of whether such a proposal by some of the developing countries, possibly the entire Group of 77, would stand a chance of ever being adopted (by consensus) in the Legal Sub-Committee and eventually by the General Assembly.

Ideally, any legal system, framework, or body which would establish guidelines or legal principles on how international space co-operation is to be carried out would need to be quite specific. It would need to regulate, among other matters, what kind of information, services, products and activities are to be shared between States, when such elements are supposed to be made available, the frequency of such co-operation and the format of sharing. It would also need to address the question of the status of private enterprises that carry out space activities and the question as to who is to co-ordinate all these activities including the exchange of information.

The question of whether such a legal system should provide some means of enforcing international co-operation in space is an issue of some importance. If it does not, then the question arises as to whether a system of voluntary co-operation as it exists under the Outer Space Treaty would

be respected by the space-faring countries to the full satisfaction of the developing countries. Most likely, this would not be the case from the point of view of the developing countries, as can be seen from their view of the present situation of co-operation under the Outer Space Treaty. If, on the other hand, some measures of enforcement are to be introduced, it would certainly be difficult to find the mechanism to "police" the agreement.

Since an increasing number of developing countries are joining the chorus calling for the establishment of a legal framework to regulate international space co-operation, the space-faring States will certainly make some effort to deal constructively with such desires. The developing countries will also realize in due course that their call for a new international legal order in its present vague form might not be the most productive approach. Thus, a compromise solution will have to be found as to how to deal with the legitimate concerns in a realistic and productive manner.

The developed countries have shown a willingness to discuss the matter, though somewhat reluctantly. The United States, for instance, at an early stage in the process of formulating the new agenda item on the basis of the Group of 77 proposal, brought forth the idea that the item should be tied to Article I of the Outer Space Treaty. However, any move in the direction of the establishment of an effective international legal order is unlikely to receive the support of the developed countries, in particular the United States, and most likely France and the United Kingdom as well. The developed countries naturally do not wish to be put in a position where they cannot choose which programme to open to co-operation and what information they are to share with the developing countries. This is understandable given the fact that private agencies, commercial enterprises and universities carry out various tasks in the field and are not always under the control of the government of their respective countries and also because developing countries cannot be expected to completely open their military space programmes. It seems likely that the Soviet Union for somewhat similar reasons would not go along with such a system either, though they might not oppose it as openly as other States.

Therefore, it does not seem to be productive for the developing countries to insist on a solution to their stated concerns that would run counter to the interests of so many of the developed countries and even some developing countries with substantial space programmes. Indeed, as negotiations proceed, it might often be difficult to get agreement even among the Group of 77 States on matters of detail, making the process extremely time-consuming and complex. The question, therefore, arises as to whether the Group of 77 States of the Committee would be able to achieve their wish for the establishment of a legal regime by consensus without resorting to voting by majority, a process which most, if not all, of the members of the Group of 77 in the Committee would not currently wish to exercise in order to press their demands.

The Committee and its subsidiary machinery provide an appropriate vehicle by which the Group of 77 could seek to develop an agreed regime that would be acceptable to all members of the Committee, including the space-faring States, and that would further the spirit of Article I of the Outer Space Treaty. The advantage of a consensus agreement towards such a regime is clear from the number of treaties that have already been adopted and widely subscribed to by States and is the only way that meaningful and effective steps towards international co-operation in the sharing of benefits could be undertaken.

The question remains open as to whether it will be possible at all to legally specify a principle which is perhaps inherently more a general moral issue. Will States co-operate better if a legal system obliges them to do so? They are likely to co-operate if they can be convinced that it is indeed economically or socially beneficial to them to do so and also perhaps if they are constantly pressed by the developing countries in a constructive manner. In this sense, the new item on the agenda of the Legal Sub-Committee might serve the developing countries well in focusing the attention of the international community on the need for the space-faring States to live up to the spirit of Article I of the Outer Space Treaty, and if that opportunity is used constructively to demonstrate how such co-operation will be mutually beneficial, it may then lead in the long run to negotiations on acceptable legal principles.

As the United States and the USSR indicated when the Outer Space Treaty was adopted, they consider that any specific obligations for international co-operation would have to be based on further specific agreements, not on an interpretation of Article I. Furthermore, it is clear that they are going to be very hesitant to accept any legally binding conditions on their space activities or on the sharing of the results of those activities. The Group of 77, on the other hand, is committed to making more specific and more clearly obligatory the general requirements of Article I.

A possible approach that might satisfy both of these positions would be to undertake broad-ranging discussions of international co-operation in space on the basis of Article I with a view to identifying specific forms of co-operation that could be the subject of specific agreements. The principles on remote sensing, while not legally binding, nonetheless indicate that the space-faring nations are willing to make commitments to certain co-operative measures. By gradually elaborating a series of fairly narrow agreements and by gradually converting those into binding form, a legal framework for international co-operation could progressively be developed. While this would be a slow and difficult process, at least under the present conditions of international relations, it would seem to be the only procedure that allows any prospects of success. The first step then might be for developing countries, perhaps in consultation with some of the more sympathetic developed countries, to suggest a number of specific co-operative activities for discussion and see how other countries respond.

EVENTS OF INTEREST

A. PAST EVENTS

Reports

*Review of the Work of the United Nations Committee on the Peaceful Uses of Outer Space, New York, 5-15 June 1989**

The Committee on the Peaceful Uses of Outer Space held its thirty-second session in New York at its Headquarters from 5 to 15 June 1989. The Committee had before it the reports of its two subsidiary bodies, the Scientific and Technical Sub-Committee¹ and the Legal Sub-Committee that met earlier in the year.

The Committee considered the advisability of the General Assembly declaring 1992 as international space year. It recommended that the General Assembly endorse the initiative of international scientific organizations and bodies to designate 1992 as international space year in its resolution on international co-operation in the peaceful uses of outer space.

The Committee recommended that the United Nations Programme on Space applications training and educational capabilities should be utilized to bring about a meaningful role for the United Nations in the international space year through Member States voluntary contributions. In regard to possible international space year activities, the Committee took note of the USSR² and the United States³ papers that enumerated possible activities that could be undertaken by national and international space organizations. The Committee also took note of Committee on Space Research (COSPAR) and International Astronautical Federation (IAF) plans for celebrating 1992 as international space year with a joint world space congress in Washington, D. C. and a major programme on "Mission to Planet Earth."

Under the agenda item "Ways and means of maintaining outer space for peaceful purposes," the Committee recognized that, through its work in the scientific, technical and legal fields, it had an important role to play in

* The views expressed in this report are those of the author in his personal capacity and do not necessarily reflect those of the United Nations.

1. Doc. A/AC.105/429.
2. Doc. A/AC.105/C.1/L.161.
3. Doc. A/AC.105/C.1/L.160.

this area. The Committee had responsibilities relating to the strengthening of the international basis for the peaceful exploration and uses of outer space and this could cover, among other matters, further development of international law. Strengthening international co-operation in the peaceful exploration and uses of outer space implied the need for the Committee itself to improve, whenever necessary, the methods and forms of its work.

As in previous years, the socialist countries and non-aligned countries maintained that the peaceful uses of outer space and the prevention of an arms race in outer space were two sides of a coin and that COPUOS could and should play an important supplementary role to contribute to the work of the Conference on Disarmament in technical aspects of the question. Western countries stressed that issues relating to the prevention of arms race in outer space were disarmament questions within the exclusive jurisdiction of the Conference of Disarmament. The Committee also recorded divergent views on the Soviet proposal for the establishment of a world space organization (WSO) which was referred to during the discussion under this item because, in the view of some delegations, the establishment of such an organization offers an effective means to promote the use of outer space for peaceful purposes.

With reference to the implementation of the recommendations of the UNISPACE 82 Conference held in Vienna in 1982, the Committee endorsed the recommendations of the Working Group of the Whole of the Scientific and Technical Sub-Committee on the implementation of the recommendations of UNISPACE 82 and recommended that the Working Group should reconvene in 1990 to continue its work. Also, the Committee expressed its appreciation to all Governments that made or declared their intention of contributing to the implementation of the recommendations of UNISPACE 82. It took note, however, of the disappointment expressed by the developing countries at the lack of financial resources to implement those recommendations.

Regarding the United Nations Space Applications Programme of the Outer Space Affairs Division, the Committee noted that the programme had made progress in the implementation of the 1989 planned activities and endorsed the 1990 activities planned for the Programme. It expressed its appreciation to those Governments that provided fellowships through the United Nations for in-depth training as well as to several countries and international organizations for co-sponsoring United Nations workshops, training courses, and meetings of experts.

On the subject of regional and interregional co-operation mechanisms, the Committee noted with satisfaction that the Secretariat had continued to seek to strengthen regional co-operation mechanisms and the implementation of various recommendations of UNISPACE 82. Those respective projects included the United Nations Meeting of Experts on Regional Space Information Systems held at Lima, Peru in October 1988, the United Nations Meeting on Remote-Sensing and Satellite Meteorology Applications to Marine Resources and Coastal Management held at

Maspalomas, Gran Canaria, Spain in May 1989, and the United Nations Workshop on Oceanographic/Marine Space Information Systems to be held at Karachi, Pakistan in July 1989. Also, included were the Programme's technical advisory missions to develop a remote sensing information programme in Africa that also originated from UNISPACE 82.

The Committee discussed the issue of space debris extensively during the session. Following its oral suggestion at this year's session of the Scientific and Technical Sub-Committee, Sweden submitted a working paper⁴ on the issue, co-sponsored by Australia, Belgium, Canada, the Federal Republic of Germany, Nigeria and the Netherlands, proposing to include the question of space debris on the agenda of the Scientific and Technical Sub-Committee at its 1990 session. Eastern European Countries favoured discussion on space debris. Non-aligned countries did not see much benefit that they could obtain from the consideration of the question and were not particularly receptive to it because they did not want this new item to take attention away from the consideration of the recently-adopted agenda item in the Legal Sub-Committee relating to the legal aspects of sharing of outer space benefits by all countries, an item of special concern to developing countries. They did not, however, oppose the consideration of the problems relating to space debris. In contrast, the United States strongly rejected the proposal, finding it premature to put the question on the agenda of the Sub-Committee due to the fact that much work remained at the national level. Therefore, the Committee postponed putting the question of space debris on the agenda and concluded that the Member States should pay more attention to the problem of collision with space debris and other aspects of the space debris problem. It also called for the continuation of national research on the question.

Regarding the use of nuclear power sources in outer space, both developed countries and developing countries expressed concern over the uncontrolled re-entry of objects carrying radioactive material. The Committee endorsed the Scientific and Technical Sub-Committee's recommendations to retain the item as a priority on its agenda for the next session and to continue the efforts of the Working Group on the Use of Nuclear Power Sources in Outer Space at the session. In terms of legal implications of nuclear power sources, the Legal Sub-Committee has for some years been engaged in drafting a set of legal principles and this year it adopted the two new draft principles on consultations and settlements of disputes which the Committee welcomed. The Committee, however, also urged the Sub-Committee to further its progress on the elaboration of remaining draft principles with a view to concluding its work on this item so that the General Assembly could adopt the legal principles as early as possible.

On the subject of remote sensing, the Committee recognized the importance of international efforts to ensure the continuity, compatibility

4. Doc. A/AC.105/L.179.

and complementarity of systems for the remote sensing of the earth. It endorsed the Sub-Committee's decision to retain it as a priority item for the next session.

The Committee took note of achievements in space transportation systems. It referred to the progress of those in operation or planned by China, the European Space Agency (ESA), India, Japan, the Soviet Union, the United Kingdom, and the United States.

On the examination of the physical nature and technical attributes of the geostationary orbit and the examination of its utilization and applications, the Committee noted that delegations reiterated and elaborated on the views concerning the question of geostationary orbit expressed at earlier sessions and reflected in earlier reports of the Committee and its two Sub-Committees. The Committee also took note of the results of the ITU World Administrative Radio Conference on the Uses of the Geostationary Orbit and Planning of Space Services Utilizing It which intended to guarantee in practice equitable access to the geostationary orbit.

Further, the Committee endorsed the decision of the Sub-Committee to continue consideration of matters relating to life sciences, global change, and planetary exploration and astronomy, at its next session. It also endorsed the recommendations that COSPAR should arrange a special presentation on progress in the geosphere-biosphere (global change) programme.

It was also recommended that the new theme fixed for special attention at the 1990 session of the Sub-Committee should be "the use of space technology in terrestrial search and rescue and in disaster relief activities." Furthermore, the Committee endorsed the recommendation to invite COSPAR and the IAF to arrange a symposium on the theme at the following session of the Sub-Committee.

Regarding the work of the Legal Sub-Committee on the definition and delimitation of outer space and utilization of the geostationary orbit taking into account the needs of developing countries, the Committee noted that the delegations had expressed a variety of views. Some delegations supported a conventionally defined boundary line between air and outer space and other delegations expressed the view that a definition or delimitation of outer space would impede progress in outer space. The Committee noted, however, further progress had been made toward a convergence of views on the question of activities of States in the utilization of the geostationary orbit and also expressed the hope that a consensus on that question could be reached in the near future.

Under the new agenda item relating to the legal aspects of sharing of outer space benefits by all countries, taking into account the needs of developing countries, the Committee endorsed the recommendation of the Legal Sub-Committee that in considering the legal aspects of the principle that outer space should benefit all countries, the Sub-Committee should consider all relevant national legislation as well as treaties, conventions,

agreements, principles, and declarations relating to outer space, particularly Article 1 of the Space Treaty that calls for the guarantee of freedom of exploration, scientific investigation, and use of outer space. It further endorsed that a working group be established no later than 1991 to assist the Sub-Committee in its work on this item.

In consideration of the new item on the agenda, spin-off benefits of space technology, the Committee agreed that spin-offs yield substantial benefits in many fields, including medicine, mechanical industry, energy, environmental protection, agriculture, forestry and marine fisheries. The growing economic importance of those benefits was, in some cases, greater than the cost of the space programme themselves. Also, the Committee stressed the significance of international co-operation in developing spin-off benefits of space technology and in ensuring that all countries, particularly the developing countries, had access to those benefits.

N. Jasentuliyana

Director, Outer Space Affairs Division
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*International Colloquium on the Law of Outer Space, Malaga-Torremolinos,
October 9-14, 1989*

The President opened the International Institute of Space Law Colloquium with words of welcome and compliments to the Spanish host organization, which had to organize this Congress on such a short notice.

The first session had as its subject "Legal implications of the application of the principle according to which the exploration and use of outer space shall be carried out for the benefit and in the interests of all states, taking into particular account the needs of developing countries." This session was chaired by *Prof. Dr. A.A. Cocca* (Argentina), with *Dr. B. Schmidt-Tedd* (Federal Republic of Germany) acting as rapporteur.

In the first session, five papers were presented. In addition, due to the large amount of papers for the second session, four papers on 'The legal aspects of protection of the outer space environment' were also presented during this session.

Dr. Doyle (U.S.A.) spoke about the legality, practicality and reality of the use of outer space by developing countries. There is no question that, as a matter of legality, all nations are entitled to use outer space. As a practical matter, use depends on the availability of launch services and inasmuch as such means are sufficiently available, this criterion is met as well. However, if one looks at the reality question, according to *Mr. Doyle*, "it resides in the economics of the matter." In order to obtain access to and use of space, a nation's surplus wealth needs to be allocated on a priority basis to such access to and use of space. Therefore, if one discusses "the reality, it entails vision of leadership and national commitment."

Dr. Jasentuliyana presented a review of recent discussions relating to aspects of Article I of the Outer Space Treaty. He discussed the legal nature of the "benefit principle." Developing countries wish to create a system of legal enforcement of the principle, but this has not met with sympathy from the space-faring countries. In his view, a duty to cooperate is difficult to enforce; there is a moral and philosophical obligation rather than a legal one. But discussion in the COPUOS Legal Subcommittee will at least provide a forum for the developing countries to draw attention to their concerns. Nevertheless, this does not exclude the possibility of reaching agreements for cooperation on specific topics. This has been done for instance, in the case of remote sensing.

Prof. Lyall presented a paper on space telecommunications organizations and the developing countries. The preambles of all three global telecommunications organizations - INTELSAT, INMARSAT, INTERSPUTNIK - expressly or implicitly incorporate the "benefit principle." Although INTELSAT succeeds in realizing the common benefit principle rather effectively, the problem is that the organization meets with more and more competition from other systems which are not themselves dedicated to a global nondiscriminatory service. *Prof. Lyall* hopes that the common benefits principle, as embodied in the various preambles, resolutions and treaties, will not be reduced to "cosmetic affirmations" and thereby seriously weaken international law.

Mrs. Specter gave a presentation about the International Space Year (I.S.Y.) in 1992. She sees I.S.Y. as an opportunity to relate earth observation activities to the benefits and interests of developing countries. Several obstacles need to be overcome if developing countries are to participate fully in I.S.Y., such as lack of funding, inadequate communication or lack of qualified personnel. An extensive historical overview, starting with the International Geophysical Year (I.G.Y.) in 1957, shows that many of the obstacles of the I.G.Y. and I.S.Y. are similar, and thus lessons can be learned from the past.

Prof. Sybesma-Knol (Belgium) discussed the role of regional organizations in the implementation of the "benefit principle". The stipulations, subject to which outer space may be used, including the "benefit principle," are additional obligations to the legality of such use. E.S.A. may serve as a model for effective cooperation between developed and developing countries. Cooperation may take the form of observer status or of participation agreements. An extensive overview of such agreements is provided. E.S.A. also cooperates closely with the U.N. in this field. One of the reasons why the potential of cooperation has not been fully utilized is the lack of interest and commitment on the part of developing countries.

Prof. Gorove (U.S.A) talked about space debris in an international legal perspective. In view of the applicability of the Liability Convention, he is of the opinion that space debris is to be regarded as (a part of) a space object. In order to reach an adequate solution to the debris problem, it is essential to deal with it on an interdisciplinary level. A group of

technical and scientific experts should, after careful study, recommend specific courses of action. Next, an expert group of politicians and lawyers should create or devise the regulatory framework, including a consultation procedure which could follow the pattern in the Moon Agreement. Also, the U.N. should issue an appropriate questionnaire to gather relevant information from space-faring nations about the measures they are already taking in connection with their space activities in order to reduce space debris. Responses received to such a questionnaire may point to the types of regulatory measures that may have a chance of international acceptability by the space-faring nations.

Ambassador Cocca discussed the space environment as a common heritage of mankind. The well-being of mankind can only be obtained through the application of the legal principle of the common heritage of mankind. The most important right of mankind is the right to life and survival. The environment is also the common heritage of mankind and mankind is a legal subject *par excellence*. The author believes that a protocol to the Space Treaty, rather than a new convention, should safeguard the space environment and his paper provides some details about the contents of such a protocol.

Mrs. Catalano Sgrosso reviewed the present rules of international space law and made some concrete suggestions for new legal measures and instruments. She believes that a new, specific global treaty is needed. Such a treaty should be connected with the Liability Convention, and damage caused to the space environment should be based on liability for fault. Proof of fault should be gathered by a committee of technical experts, as the guardians of the "Province of all mankind." A compulsory dispute settlement procedure should form part of this new convention.

Finally, *Prof. Böckstiegel* discussed the procedures to clarify the law regarding environmental aspects of activities in outer space. The paper gives an extensive overview of the efforts made so far to clarify the existing law and assess future steps. In the future, concrete proposals must be formulated and drafts must be submitted to states and institutions for action. The I.L.A. Space Law Session in 1990 will deal exclusively with this topic and will decide on the appropriate action. In *Prof. Böckstiegel's* view, a nongovernmental interdisciplinary group of experts should be established. In the long run, the ideal solution is a new instrument, either in the form of a new treaty, or of a protocol to the Liability or the Registration conventions, or in the form of standards and recommended practices.

In the general discussion, following the presentation of papers, *Prof. Vereshchetin* (U.S.S.R.) observed that raising the subject of access to space "benefits" in its general form reaches far beyond the framework of space law as one of the branches of international law and should be considered and decided according to the views of the general theory of international law. The problem boils down whether international law, operating now as a measure applicable to all states, big and small,

developed and developing, should or could be transformed into a means of distribution and redistribution of all benefits in the interests of a certain group of states. In other words, the question involves the role that international law is to play in the solution of one of the most acute global problems of contemporaneity - the overcoming of underdevelopment, the formation and the filling with real, normative content the so-called "right to development."

As correctly noted by the Polish lawyer A. Wasilkowski, "states connect with international law an ever increasing number of hopes and they appoint to this law new functions. At the same time, the international law" has, if at all, little "means at its disposal to realize all these hopes and functions. Will the ever increasing number of functions and assignments change the existing situation? If we answer this question positively, then there is no doubt that we are dealing with the new international law."

In Dr. Vereshchetin's view, it would be more correct and more promising to raise the matter not of access of developing countries to results of space activities, *i.e.* activities done by other states, but ensuring broader participation by the developing countries themselves in these activities. Such opportunities open up in the further development of international cooperation in the field of space exploration and its radical improvement, and lead to active involvement of developing countries in the creation and utilization of advanced space technology. Efforts should be directed to a substantial improvement of forms and methods of such cooperation and to taking into account the economic situation of the partners, their scientific and industrial potentials. This kind of cooperation should be an important element of the "right to development."

In this connection, a serious study and discussion should be carried out of the Soviet proposal, first made in 1985, on the establishment of a world space organization within which it was proposed to set up a Development Fund for financing international projects carried out mainly for the purposes of rendering help and assistance to developing states in the practical application of space science and technology. The main provisions of the charter of a world space organization, presented by the Soviet Union in 1988, provide for the payments to the fund to be 90 per cent from states conducting most activities in the field of exploration and use of outer space.

Within various structures and mechanisms of international cooperation many declarative provisions and rules of general character, relating to the problem of access of developing countries to space "benefits", must be filled with specific content and bring tangible profit and real results to these countries. This procedure seems to be most realistic and productive. It will enable making the "benefits" of space activities available to developing states much quicker than attempting to elaborate a normative conception directed at an *a priori* distribution of these "benefits" among various groups of states.

Prof. Christol (U.S.A.) pointed out the successful work of the Committee on the Peaceful Uses of Outer Space (COPUOS) for international cooperation and the importance of the basic space law treaties. Besides those early efforts, at present, there is a growing importance of less formal rules and the practice of customary international law. He underlined especially the positive example of the Principles Relating to Remote Sensing of the Earth from Outer Space, which were adopted by the U.N. General Assembly on December 3, 1986 in Resolution 41/65.

Dr. Doyle commented on the distinction between legality and reality of economics and the level of commitment. He observed that the history of the last 30 years of the use of outer space included a wide range of international cooperative programs. Systems for meteorological and communications services exist, such as the Automatic Picture Transmission (A.P.T.) meteorological service which has permitted all countries, during the last 25 years, to have access to realtime meteorological imaging with use for agricultural management, storm warning and other resources management. INTELSAT makes global satellite communication services available. There are now about 150 countries using the INTELSAT system. These are programs of historical success where nations made a commitment of resources and sustained that involvement. The United States, the U.S.S.R., and the Western European communities have invested the equivalent of billions of dollars in aerospace technology development which is now being made available to all the nations in the world at no cost for development. "This offering of sophisticated resources to all nations is a tangible contribution for the benefit of all countries and constitutes a great deal more than talk."

Prof. Almond (U.S.A.) underlined the statement of *Dr. Doyle* and asked for further clarification of the U.S.S.R. proposal for the establishment of a World Space Organization, which he found not sufficiently clear in detail. As far as the position of the developing countries - with respect to the participation on the use and exploration of outer space - is concerned, he does not see the necessity of contribution and commitment of those countries to the technology-development. He pointed out the special efforts of the "democratic countries".

Dr. Jasentuliyana (Sri Lanka, Director, U.N. Outer Space Affairs Division) referred to the legal obligations arising out of the Outer Space Treaty as a basic document for international cooperation in the exploration of outer space. Besides concrete and binding legal obligations the "Group of 77" is in favor of technology transfer for the benefit of developing countries as a political perspective. Without arguing to justify this policy position, he recalled that even a technical organization as I.T.U. supports this kind of unilateral technology transfer.

With respect to *Prof. Almond's* statement, *Prof. Vereshchetin* recalled that the details concerning the U.S.S.R. proposal for a World Space Organization of 1985 were submitted to the United Nations during the 31st Session of COPUOS in document A/AC.105/L.171 (June 17, 1988). Also, he

appealed not to make a distinction between "democratic states and others," as they reflected a political terminology of the past.

Dr. Jasentuliyana made clear that the developing countries, looking for access to space, have not made up their minds about a World Space Organization. A restrictive position of some countries concerning the transfer of technology and access to space would, from his point of view, lead to a clear support of the U.S.S.R. proposal. *Mr. Michael Potter* (U.S.A.) remarked that the question of equalization of resources is not specifically related to space business. *Prof. Christol* saw a need to clarify the discussion on technology transfer in the sense "who, what, when and to whom".

The second session had as its subject "Legal aspects of the protection of the outer space environment." This session was chaired by *Dr. M. Menter* (U.S.A.) with *Prof. Dr. S. Sybesma-Knol* (Belgium) acting as rapporteur. A total of twelve papers were presented in this session. However, because of time limits, four of these were added to the Wednesday morning session (the papers of *Prof. S. Gorove*, *Prof. K.H. Böckstiegel*, *Mrs. G. Catalano Sgrosso* and *Prof. A.A. Cocca*, respectively). Thus the report on these presentations has been included in the report on that session.

The afternoon part of the session started out with the presentation of *Prof. Dr. I.H. Ph. Diederiks-Verschoor* on "The Increasing Problems of Space Debris and their Legal Solutions." She described the rapidly increasing amount of debris from various sources and the serious threats it poses to scientific, commercial and military space activities. In the second part of her paper, she focused on what could be done about the prevention of damage by debris and about salvage.

The next speaker, *Dr. E. Fasan* (Austria) stressed the possible adverse changes in the environment of outer space and danger to human lives, caused by hazardous activities. He proposed to draw up a list of activities which could be the cause of harmful effects and the drafting of a new convention which will prohibit such activities.

For *Prof. Jonathan Galloway* (U.S.A.) ("Mission to the Atmosphere"), sovereignty, as the main basis of the state system, is still an overriding factor in studies of the atmosphere which is within outer space as well as within the air space of states. However, common solutions to the degradation of the atmosphere, such as depletion of the ozone layer, greenhouse effect, acid rain and so on, must be sought on state and global levels.

Dr. Vladimir Kopal (Czechoslovakia) ("The Need for International Law Protection of the Outer Space Environment against Pollution of any kind, Particularly against Space Debris") stressed the various causes of pollution of the space environment, each of them deserving particular attention and assessment. The greatest danger does not arise from the launchings of space objects by means of rockets and space shuttles: their environmental effects remain negligible compared to other anthropogenic causes. A much greater danger arises from the emplacement of weapons in

outer space and from their testing in the space environment. Having said this, *Dr. Kopal* went on to describe the dangers arising also from nonmilitary activities.

Dr. Bess C.M. Reijnen (the Netherlands)("Pollution of Outer Space and International Law"), having noticed the absence of any significant advances in the prevention of the pollution of outer space during the last few years, set out to investigate, first of all, in what way similar branches of international law (air law, law of the sea) have dealt with this matter, and secondly, which basic notions of international law might be applicable to the subject of environmental pollution in general.

Dr. Hassan Safavi ("Legal Aspects of Protection of the Outer Space Environment") also studied the various sources of space pollution and made some suggestions for cooperation of states by elaboration of international rules to avoid increasing space pollution and to clear outer space from debris in order to prevent and to minimize the fatal and harmful consequences of space activities. In his conclusions, he gave a number of suggestions, while stressing the international characteristics and the close interdependence of technological developments and legal aspects in space law.

The paper by *Prof. William Wirin* (U.S.A.), entitled "Space Debris 1989," was based on the results of a workshop held in April 1989 in Colorado Springs concerning the current status of the space debris issue. The purpose of this workshop was to bring together technical experts on the physical aspects of debris and legal experts on the law and policy aspects. The timing of the workshop was related to the publication of two reports, one by ESA (November 1988) and the other by the Interagency Group (Space) submitted to the National Security Council in February 1989. *Professor Wirin* gave a detailed analysis of the reports.

The last paper of the session was presented by *P.M. Sterns* (U.S.A.), and *L.J. Tennen* (U.S.A.) ("Recent Developments in the Planetary Protection Policy: Is the Outer Space Environment at Risk?"). According to the authors, the purposes of a "celestial" environment protection policy include the preservation of earth and space environment from harmful contamination, the prevention of compromising scientific investigation, the search for alien life, and the promotion of international peace and security by providing for freedom of activity in space for all states. Protection is comprised of legal and scientific components. The scientific community has adopted and reevaluated certain guidelines, while international legal commitments have so far only taken the form of broad principles.

Several speakers took part in the extensive discussion. *Prof. DeSaussure* (U.S.A.) had a point for *Prof. Diederiks-Verschoor*, mainly about state jurisdiction over foreign space objects. His main concern was with earth-threatening devices and occurrences. In his opinion, if a state is in danger and in a position to avert such danger, it should have the right to exercise jurisdiction.

Prof. Christol pointed to the principles laid down in the Stockholm Declaration and, in particular, to Principle XXI. States have to restrain from engaging in potentially harmful activities, because the slogan "let the polluter pay" does not provide a solution; it is impossible to put things back in their former state. Furthermore, he was doubtful about the possibility of "improved design techniques" because he could not imagine an international agency dictating the U.S. automobile industry their design of cars. Finally, he cautioned against endeavoring to stretch existing treaty provisions to cover new conditions. He indicated that this never works, and a new treaty is better.

Prof. Gál (Hungary) maintained that a separate protection system for outer space is impossible. It is not to be separated from air space. On the other hand, the notion of "space activities" should be defined more clearly and the various existing instruments, such as the E.N.M.O.D. Convention and the Test Ban Treaty, should be brought into line in this regard.

Dr. Doyle had questions on the legal status of derelict spacecraft. Was it a question of responsibility or of jurisdiction? Also, did interference or contamination constitute "damage by spacecraft?"

Dr. Jasentuliyana said he had noted that there is apparently a consensus about the seriousness of the problem but that it is not so clear what should be done about it, and how. It is unfortunate that COPUOS has not been able to take on this item, as had been proposed in a working paper by western nations. In response, *Prof. Wirin* pointed out the possibility of bilateral negotiations between the leading space powers in an effort to legitimize their actions; these results would then form the beginning of a multilateral instrument. But how would new or prospective space nations react to the restrictions which will ensue? Will they be ready to accept them? *Prof. Wirin* was of the opinion that the U.S. had been opposed to a U.N. set of regulations but that now the U.S. and the U.S.S.R. have perceived the danger for themselves, and may be ready to negotiate. The other nations have not yet sensed the danger. It must be hoped that an agreement will be reached before the third world begins its protest.

Prof. Almond would have liked to see the notion of "reasonableness" of certain activities introduced. He wondered whether a regulatory regime is at all possible. Other speakers (*Wirin, Doyle*) thought that such a regime is possible but that it must be accomplished by the "users", not by the "philosophers!" At present, consultations are already taking place between Japan, the U.S. and the U.S.S.R. *Prof. Gorove* agreed that initially each space-faring state would do its own debris prevention but that an international regime could result from this. He did not see any reason why the developing countries would not abide by such a regime so long as the obligation was couched in a language that made allowance for developing nations to do what they could reasonably be expected to do in view of their limited resources. Before closing the second session, *Dr. Menter* suggested

the formation of a working group of lawyers, scientists, economists, etc., to set standards and elaborate an agreement from such standards.

The third session had as its subject the "Legal Status of the Geostationary Orbit in the Light of the Recent Activities of ITU." This session was chaired by *Dr. Vereshchetin* with *Dr. van Traa-Engelman* (the Netherlands) acting as rapporteur.

The first speaker, *Mr. Rebellon Betancourt* (Colombia), expressed the opinion that the so-called "geostationary ring" is not covered by the legal regime of the Outer Space Treaty but should be considered as a natural resource over which, according to U.N.G.A. Resolutions 2692 and 3281, permanent sovereignty is to be exercised by the subjacent equatorial countries.

Dr. Bourély (France) approached the issue of the I.T.U. regulation of the geostationary orbit in light of recent rules governing Mobile Communication Satellites. In particular, he emphasized the problem of discrepancy between international rules and national legislation.

Prof. Christol spelled out the achievements of the 1985-1988 WARC and came to the conclusion that the decisions taken serve the respective interests of the developing countries and the advanced ones by guaranteeing in practice equitable access to the orbit-spectrum resource. He noted the fact that equitable access does not necessarily mean equality but stressed that "equitable" will have to be assessed following considerations of economy and efficiency. Furthermore, he observed that in the future; on the one hand, existing uses should be protected while, on the other hand, new opportunities should be opened.

The paper of *Prof. Fernandez Brital* (Argentina) on the geostationary orbit (G.S.O.) and recent I.T.U. activities concentrated on the position of equatorial countries in relation to the G.S.O. He advocated that the G.S.O., being a natural resource but nevertheless belonging to outer space, should be governed by space law and hence be used by all countries without any special right of use by equatorial countries.

Ms. Ospina (U.S.A.) dealt with the subject I.T.U. and WARC-ORB by asking the question: Will the Revised Radio Regulations result in a *sui generis* legal regime for the G.S.O.? She came to the conclusion that, as yet, only a minor part of satellite radio frequencies is subject to a Plan, a fact which does not justify the need for a specific legal regime.

Dr. Perek (Czechoslovakia), who covered the subject "Deep Space at WARC-ORB-88," observed that a new definition of deep space has been proposed by the International Radio Consultative Committee (C.C.I.R.) of the I.T.U. in order to ensure a better use of frequencies while taking account of technical progress. According to the author, the new definition, which maintains the previous geometrical criterion but enhances precision by fixation of the given value of the distance, might influence opinions on the definition of outer space. Moreover, it will facilitate a distinction between nuclear reactors to be banned in near earth orbit and nuclear reactors providing a viable source of energy for unmanned flight far from the sun.

The next participant, *Dr. Milton Smith* (U.S.A.), discussed the "Compliance of Post-Space WARC ITU Regulatory Regimes with International Space Law." He came to the conclusion that I.T.U. Plans comply with fundamental principles of space law, although they place restrictions on the freedom of use of outer space. Inasmuch as these restrictions were established in accordance with the "common interests principle" and they do not violate the principles of space law.

Dr. Wiessner (U.S.A.) was the last speaker on the subject. He proposed that unused slots and frequencies according to the I.T.U. Plans should come under authority of the International Frequency Registration Board for leasing purposes, thus providing finances for the transfer of technology and know-how for countries in need.

During the discussion, following the presentation of papers, *Dr. Ploman* (Sweden) noted that many speakers referred to the question whether or not I.T.U. rules are in compliance with U.N. regulation. He stated that if these organizations live in different worlds, some of the difficulties experienced are due to the lack of coordination by national governments. Additionally, he pointed out that apart from the governing Telecommunication Convention, the Radio Regulations annexed to the Convention also have treaty force. However, the problem is that the Radio Regulations are so comprehensive and complicated that only a few people in the world have a full knowledge of them.

Prof. Detter de Lupis (Sweden), who agreed with *Dr. Ploman* about the lack of coordination by national governments, brought the problem back to the need to improve communications particularly within national states. As far as I.T.U. is concerned, she noted the problem of the identity of the respective delegate, representing the Telecommunication Department rather than Foreign Affairs or State Department, which, in turn, became a complicating factor in the decision-making process. She also stressed the identification problem in connection with the role of Administrations "which are not states properly so called," as are members of international organizations such as the I.T.U. Consequently, she asked for improvement for coordination and identification.

Prof. Christol referred to the internal conflict appearing in Art. 33 of the I.T.U. Convention. In his view, the equitability requirement is not consistent with standards of efficiency and economy. He was of the opinion that equity asks for a fair and just sharing of resources. This depends on relative needs and cannot be dealt with in abstract terms. He also observed that equity, which does not relate to equal sharing, may call, on the one hand, for greater shares for some claimants. On the other hand, it may result in smaller shares for others "provided it would not be efficient or economical" to accord larger shares. In connection with this, he asked for information and research on the matter.

Dr. Wiessner noted that if we bring in concepts as equity, justice has to be done by the process of negotiation. *Prof. Christol* remarked when considering equity, one should distinguish between equity and equality.

Dr. Doyle who agreed with *Prof. Detter de Lupis* on points regarding decision making within I.T.U., was of the opinion that the problem of non-used information was caused by the lack of adequately trained delegates.

Dr. Jasentuliyana referring to the opening of the discussion by *Dr. Ploman*, stated that there was definitely no great conflict between the I.T.U. and the U.N. including COPUOS and that both organizations were fully aware of the respective activities.

Prof. Sybesma-Knol pointed out that the seeming lack of coordination and confusion on national attitudes in the various U.N. agencies and organs is certainly caused by a lack of coordination within the U.N. system itself. In her view, it should be a matter of prime concern within national administrations to ensure perfect coordination of national standpoints. Moreover, experts should be added to national delegations in order to overcome problems of not properly informed delegates and changing diplomats. Finally, she emphasized the need to provide the developing world with information which was one of the most important tasks of the United Nations.

During the fourth session of the Colloquium on "Other Legal Subjects," chaired by *Dr. N. Jasentuliyana* and assisted by the rapporteur, *Mr. P.H. Tuinder* (Netherlands), many papers were presented. Notwithstanding the limited time available, the able way in which *Dr. Jasentuliyana* chaired the session and his concise summary of so many different subjects which even allowed time for discussion, made this session a resounding success.

The first speaker, *Prof. Almond*, outlined the development of the international law of outer space. According to his opinion, this development is comparable with the already existing patterns of law applicable to terrestrial relations and activities among states. State practice coupled with treaties and international agreements will provide the framework needed for the increased space activities of states.

The next speaker, *Mr. Collins* (U.K.), analyzed the future problems relating to the use of low earth orbits (L.E.O.). The regulation of this use will raise more difficulties than the use of the G.S.O. Space objects in such orbits do not remain in the same position in relation to the earth as in case of the G.S.O. and make the definition of low earth orbits complex. Although the need for regulation still lies somewhere in the future, negotiations on L.E.O. traffic zones already should be considered now, as these negotiations will be a long-term process.

Prof. DeSaussure examined the existing regulatory framework with regard to civil jurisdiction over the international space station. After analyzing the Intergovernmental Agreement (I.G.A.), he concluded that this agreement addresses the civil jurisdiction only in a limited way and that it is necessary to create a special agreement between the partners of the international space station which could set out standards for a civil jurisdiction on board.

Dr. Gál gave some reflection on the applicability and obligatory character of positive space law rules. He expressed certain doubts in that respect. He also noted a strong relationship between international space law sources and municipal space law rules as a consequence of the non-self-executing character of the Space Treaty.

Mrs. E. Galloway (U.S.A.) developed new views, observing a widening gap between the words used to define space law and the actual conduct of space activities. Therefore, it is necessary to identify and update all sources of space law which are relevant to present uses and exploration of outer space. Methods must be devised to coordinate international and national space laws.

Prof. P.P.C. Haanappel (Canada) addressed the problems raised by the aerospace plane concept. The aerospace plane will combine features of air- and spacecraft. A legal regime for this vehicle must be based on a functional approach and may borrow elements from the legal regime for both air travel and space flight.

Mr. B. Hurwitz, a young space lawyer from Israel, examined the Cosmos 954 incident and settlement of the claims with regard to the implications for international law, in general, and space law, in particular. He concluded that the Cosmos 954 incident was a precedent for the establishment of the principle of obligations of states to assure that the international community will benefit from technologies which have international ramifications, despite the dangers which the exploitation of such technologies may involve.

Mrs. P.L. Meredith (U.S.A.) gave a comparison of the three distinct licensing regimes in the United States governing private activities in outer space. Five basic elements can be identified in the three licensing regimes which can provide a model foundation for future licensing regimes in the U.S. and other countries.

Mr. M.A. Potter (U.S.A.) analyzed the impact of the use of outer space on terrestrial human rights. Space law is unlikely to serve as an exclusive mechanism for confronting the challenges presented by the conflicts of human rights issues and the law of outer space. A mixture of domestic legal and international legal responses to these issues can be expected.

The registration of space objects was analyzed by *Mr. D.E. Reibel* (U.S.A.). Emerging issues involving the registration of space objects relate to the aerospace plane, objects that will be manufactured and launched in outer space, and the expansion of the goals of the Registration Convention.

In the contributions of *Mr. P.H. Tuinder* and *O.M. Ribbelink* (Netherlands), the development of space law was analyzed. It was suggested that new concepts for further expansion of space law are needed. The writers drew attention to similarities with the law of the sea and proposed the use of the mechanism set up for the UNCLOS III negotiations as a model for elaborating the principles of the law of outer space.

In the paper of *Dr. van Traa-Engelman*, the commercialization of space activities and the existing framework of international space law was examined. A variety of problems and legal questions which need urgent attention were identified. Securing the interests of private enterprise by international space law, the regulation of traffic rules in outer space, and a uniform national regulation in conformity with international obligations with regard to satellite communications were noted as some of the issues needing urgent attention.

Mr. F. von der Dunk (Netherlands) made a clear presentation of the problems of competence between E.C. and E.S.A. with regard to member states of both organizations participating in E.S.A.'s HERMES project. He concluded that after the realisation of E.C.'s internal market and the operational phase of HERMES, the role of E.C. in the HERMES project will become more important and the role of E.S.A. will be limited with regard to space services produced by HERMES.

Mrs. T.L. Zwaan (Netherlands) presented her paper written in cooperation with *Mr. W.W.C. de Vries*, and analyzed the liability aspects of the International Space Station Agreement. They considered the Space Station Agreement as an important step toward the further development of space law. The Agreement could serve as a model for future international cooperation in outer space. However, the question of liability leaves certain grey areas that need further examination by the Parties of the Space Station Agreements.

During the ensuing discussions, *Prof. K.H. Böckstiegel* referred to the presentation of *Mrs. E. Galloway* in which she discussed the definition of space law. He agreed with *Mrs. E. Galloway* that a functional definition was the best answer to the question of the definition of space law. All multilateral, bilateral and domestic regulations in which the use of outer space is regulated must be taken together to find a definition. *Prof. Böckstiegel* also referred to the presentation of *B. Hurwitz* on the Cosmos 954 incident. He was of the opinion that not too many conclusions should be drawn with regard to this case. However, the liability of the U.S.S.R. for the incident was accepted. He also stated that the term "compensation" does not refer to damage caused by illegal acts but refers to damage caused by legal acts, and he referred to the discussion in the I.L.A. on this subject.

Dr. M. Menter referred to the presentation of *DeSaussure* on claims settlement procedures for the international space station. He specifically mentioned the problem of tort law (criminal law) in the case of a criminal offense between a citizen of the state of registry of the space station and a citizen of another nationality. Should there be exclusive jurisdiction by either the state of registry or the state of a citizen not of the registration country? He wondered if *DeSaussure* was in favor of concluding a special agreement on criminal offenses.

Prof. V.S. Vereshchetin referred to the question of the definition of space law. He questioned the existence of space law and concluded that

space law in the broad sense does not exist in reality and hence does not exist in positive law. He stated that space law does not form an organic unity and disagreed with *DeSaussure* who emphasized the unity of space law. *Vereshchetin* considered the term space law as a purely functional one which consists of all legal rules applicable to space-related activities. He observed three factors with regard to the question of how these regulations will be coordinated: (a) there must be full conformity with the international legal obligations of a state when it adopts regulations of space-related activities, (b) a new international agreement could be concluded to coordinate the national space laws, and (c) when adopting new national space regulations states must have due regard for the interests of other states.

Prof. C.Q. Christol, referring to the law-making process, stated that law-making must fulfill the functions of certainty, predictability and enforceability. He considered it necessary to agree on specific analyses of the direction in which space law is to be expanded. He also mentioned three stages in international activities: competition, coordination, and cooperation. With regard to law-making there is a need for definitions. But since there are many undefinable concepts in space law, we must not try to define them. With regard to the enforceability of agreements he stated that there are self-enforcing agreements that imply a consensus regarding the regulation.

Prof. G. Gál referred to the intervention of *Dr. Vereshchetin* in which was stated that space law is not a specific law. *Gál* referred to the U.S.S.R. proposal of fixing the boundary at an altitude of 110 km above the earth and gave the orbiting of a nuclear weapon at an altitude that is lower than an agreed boundary as an example of problems that can arise by defining such a boundary. He was of the opinion that the lowest altitude of an orbiting satellite could be taken as the point of reference.

Prof. H.H. Almond referring to the intervention of *Dr. Gál*, stated that in his opinion the fixing of a boundary was a political decision which was strongly interrelated with security issues. He did not think that a boundary was not necessary, but that the security issue was the most important question to be solved in this respect.

At the end of the last session, the President gave heartfelt thanks to the Chairmen, the Rapporteurs and their assistants for their cooperation. She noted that the Colloquium had been very rewarding and successful as evidenced by the quality of the papers, the high level of the debate and the usual friendly atmosphere.

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Comments

*Status of the "Patents In Space" Legislation in Congress - October 1989*Status and Effects of Legislation

Legislation on patents in space -- now pending before Congressional committees¹ -- is almost certain to pass in both houses of Congress and to become law, probably by the end of 1989. The proposed legislation amends United States patent law² to include a new Section 105 which will be cited as the "Patents in Space Act."

Section 105 as it now appears in H.R. 2946 provides in relevant part:

(a) Any invention made, used, or sold in outer space on a space object or component thereof under the jurisdiction or control of the United States shall be considered to be made, used, or sold within the United States for purposes of this title, except with respect to any space object or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party, or with respect to any space object or component part thereof that is carried on the registry of a foreign state in accordance with the Convention on the Registration of Objects Launched into Outer Space.

(b) Any invention made, used, or sold in outer space on a space object or component thereof that is carried on the registry of a foreign state in accordance with the Convention on the Registration of Space Objects Launched into Outer Space, shall be considered to be made, used, or sold in the United States for purposes of this title if specifically so agreed in an international agreement between the United States and the state of registry.³

1. Hearings on H.R. 2946 were held on Sept. 21, 1989 and Oct. 14, 1989 before the House Committees on Science, Space and Technology (Subcommittee on Space, Science and Applications) and on the Judiciary (Subcommittee on Courts, Intellectual Property, and Administration of Justice) during the 101st Congress. These hearings have not been published as of this writing but references are provided to copies of prepared statements of two witnesses, those of G.R. Reynolds and S. Biniac (hereinafter "Reynolds statement" or "Biniac statement").

2. 35 U.S.C. ssc. 101 *et seq* (1982).

3. H.R. 2946, sec. 105, 101st Cong., 1st Sess. pt. 2 (hereinafter "ssc. 105" (1989)).

If enacted, Section 105 will extend the application of United States patent law to inventions in Space on U.S. registered space objects under the jurisdiction or control of the United States with certain exceptions.⁴ Such enactment will have the following effects:

1. An invention in space will be given the same priority as if it were to have taken place on United States territory. This is significant because under traditional patent law, the inventor cannot, for purposes of establishing priority (first to invent), rely on key events important for determining priority (e.g., reduction to practice) if they occur outside the U.S., typically in a foreign country.⁵

2. An act in space can infringe a U.S. patent.⁶

3. Activities in space will be treated as occurring within the U.S. for "prior art" purposes. This is significant because traditionally U.S. patent law treats differently activities outside the U.S. in determining what constitutes prior art.⁷ Absent the new legislation, a company's work in space would not be considered "prior art," barring a patent by another foreign or domestic company.⁸

4. Inventions in space will be subject to the provisions of the Inventions Secrecy Act⁹ which for national security reasons prohibits filing for a patent in a foreign country unless certain conditions have been met.

The new legislation would pave the way for the implementation of the Space Station Agreement¹⁰ signed by the United States on September 29, 1988. Article 21 of that Agreement, which deals with intellectual property, cannot be fully implemented without the new legislation.

4. U.S. patent law may apply to foreign-registered objects if specifically stipulated in an international agreement between the U.S. and the State of registry. *Id.* at Sec. 105 (b).

5. 35 U.S.C. sec. 104 (1982).

6. See 35 U.S.C. sec. 271(a) (1982).

7. 35 U.S.C. secs. 101 & 102. (To be patentable, an invention must be considered "novel" and "non-obvious," that is, the invention must not exist in, or be mere extension of the prior art).

8. See "Reynold statement," *supra* note 1, at 6 (Sept. 21, 1989).

9. See 35 U.S.C. secs. 181-88 (1982).

10. Agreement among the Government of the United States of America, Governments of Member States of the European Space Agency, the Government of Japan and the Government of Canada on Cooperation in the Detailed Design, Development, Operation, and Utilization of the Permanently Manned Space Station, Sept. 29, 1988 (hereinafter "Space Station Agreement"). For an analysis of sec. 105 of Patents in Space Act with respect to the Space Station Agreement, see Oosterlinck, *The Intergovernmental Space Station Agreement and Intellectual Property Rights*, 17 J. SPACE L. 23, 30 (1989).

The proposed legislation is consistent with international space law, particularly the Outer Space Treaty¹¹ and the Registration Convention.¹² Article VIII of the Outer Space Treaty provides for jurisdiction and control of the United States over U.S. registered space objects launched into space. This provision offers an international legal basis for extending the application of U.S. national patent law to activities in space. Article II, paragraph 2 of the Registration Convention deals with registration of and jurisdiction and control over space objects in situations where two or more countries jointly launch a space object.

Legislative History

Legislation to clarify the application of United States patent law to inventions in space was first proposed by NASA in response to President Reagan's policy statement in 1984 encouraging the commercialization of space. NASA believed that certainty with respect to protection of intellectual property would provide a necessary incentive for private firms to engage in commercial space activity -- such as the processing of drugs and other materials in space. Legislation was proposed, and on two occasions, in 1986 and in 1988, the House of Representatives passed bills almost identical to those now pending.¹³ The Senate did not act on the patent issue.

Interpretation and Analysis

Certain terms and provisions of proposed Section 105 need clarification and explanation. One such term is "outer space." As is well known, outer space has not been legally defined. Nevertheless, it would seem that an invention, for example, on the U.S. Space Shuttle while at suborbital altitudes (below 90km) and thus presumptively in foreign airspace,¹⁴ strictly speaking, would not be covered by the Patents in Space Act.

Also, the term "space object" needs clarification. Earlier versions of the bill referred to "aeronautical and space vehicle" as defined in

11. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 (hereinafter "Outer Space Treaty").

12. The Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, T.I.A.S. No. 8480 (hereinafter "Registration Convention").

13. See H.R. Rep. 99-788, 99th Cong., 2d Sess., pt. 1 (1986) and H.R. Rep. 100-51, 100th Cong. 1st Sess., pts. 1 & 2 (1987) for legislative history on the bills. See also G. REYNOLDS & R. MERGES, OUTER SPACE: PROBLEMS OF LAW AND POLICY (1989) for description of earlier legislation.

14. Space Shuttle trajectories include overflight of foreign territory (North Africa).

Section 103(2) of the NASA Act¹⁵ but the term "space object" was substituted to achieve conceptual consistency with international space treaties.¹⁶ "Space object" has not been defined in international space law. A rather useless description appears in the Liability¹⁷ and Registration Conventions, both of which state "[t]he term space object includes component parts of a space object as well as its launch vehicle and parts thereof."¹⁸ Space stations (such as the International Space Station "Freedom"), and orbiting space vehicles such as the Space Shuttle obviously are "space objects." So are, for example, free-flying experiment modules stationed near and serviced from the space station or the space shuttle.¹⁹ But it is unclear whether a facility situated on a celestial body, for example, a U.S. lunar or Martian base, would constitute a "space object."²⁰ Rejecting a proposal to explicitly cover such facilities in the legislative text, NASA, as well as Congressional committees involved, suggested that a more prudent approach would be to amend the law at a later time should it become necessary.²¹

It is important to note that, as a general rule, the Patents in Space Act will not apply to foreign-registered payloads even if the U.S. retains jurisdiction or control.²² While normally registration and jurisdiction or control go "hand-in-hand,"²³ the U.S. conceivably could have jurisdiction and control over a foreign-registered object. Article II, paragraph 2 of the Registration Convention provides for this situation.²⁴

15. 42 U.S.C. sec. 2452 (1982).

16. Convention on International Liability for Damage Caused by Space Objects, March 29, 1972 24 U.S.T. 2389, T.I.A.S. No. 7762 (hereinafter "Liability Convention") and the Registration Convention, *supra* note 12, use the terms.

17. *Id.* at art. 1, para. d.

18. *Id.* at art. I, para. d; Registration Convention, *supra* note 12, at art I, para b.

19. If not independently registered, such objects would be "components" of the object from which they are deployed. See "Reynolds statement," *supra* note 1, at 6 (Sept. 21, 1989).

20. A facility situated on a celestial body which is constructed wholly or partly from extraterrestrial materials would certainly not be encompassed because U.S. jurisdiction and control under Article VIII of the Outer Space Treaty is limited to "object[s] launched into outer space," although the jurisdiction covers objects "while in outer space or on a celestial body." *Id.*

21. ". . . space object, including a facility situated on a celestial body, and components thereof. . . ." Patents in Space Act Sec. No. 105 (a). [The underlined phrase is proposed].

22. To alleviate concerns recently expressed by some foreign nations, this was made explicit in the legislative text.

23. Outer Space Treaty, *supra* note 11, at art. VIII,

24. In the case of the International Space Station, art. II, para. 2 was not applied. Rather than register the Space Station as one space object and then divide jurisdiction and control, the partners agreed that each will register and have jurisdiction and control over flight elements supplied by it. See Space Station Agreement, *supra* note 10, at art. 5.

Although, as a general rule, the Patents in Space Act will not apply to foreign-registered payloads, the U.S. may provide for such application in international agreement with the State of registry. Such an agreement would have to refer specifically to U.S. patent jurisdiction and not merely convey general jurisdiction. (If the agreement conveys general jurisdiction only, without specific mention of patent law, Section 105(a) would apply and the situation would be that described in the previous paragraph). At the same time, general jurisdiction and control by the U.S. is not a prerequisite for the application of U.S. patent laws in particular.²⁵

It appears also that the Patents in Space Act affords the U.S. the flexibility to conclude an international agreement renouncing its right to apply U.S. patent law to inventions on U.S. registered space objects, in whole or in part, under its jurisdiction or control. Such an agreement must "specifically identif[y]" the space object to be exempted from the application of U.S. patent law.

If enacted, the Patents in Space Act will have interesting implications with respect to the transport of U.S. payloads on foreign space stations/facilities and of foreign payloads on the U.S. Space Shuttle. For example, a U.S. payload, not registered as a U.S. space object, on the Soviet MIR station²⁶ would not be subject to U.S. patent law.²⁷ However, the U.S. could agree specifically by international agreement with the Soviet Union to apply U.S. patent law.²⁸ On the other hand, a foreign payload, not registered as a space object by that foreign country, on board the U.S. Space Shuttle would be subject to U.S. patent law.²⁹ Also, in that case could the United States conclude an international agreement with the foreign country not to apply U.S. patent law?³⁰ The agreement would have to "specifically identif[y]" the object in question.³¹

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The Spaceport Florida Authority Act

During the closing hours of the 1989 Florida Legislative Session, the Legislature passed the Spaceport Florida Authority Act, which was signed into law by Governor Bob Martinez at Cape Canaveral on July 5, 1989. This Act was in response to the United States Government endorsing the establishment of a commercial expendable launch vehicle industry (see

25. See "Biniaz statement," *supra* note 1, at 1.

26. A U.S. company called Payload Systems, Inc. has arranged for U.S. payloads to be flown on MIR.

27. Sec. 105, *supra* note 3, at (a).

28. *Id.* at (b).

29. *Id.* at (a).

30. *Id.*

31. *Id.*

a series of Presidential Directives and Orders and the passage of the Commercial Space Launch Act of 1984). Commercial space activity at the state level is a new concept that Florida hopes to lead and operationalize.

The provisions of this Act should have a positive impact on Florida businesses and industries as it provides for economic growth opportunities in space education and business related areas. As a public corporation, body politic, and subdivision of the state, The Spaceport Florida Authority (Authority) is created to plan, develop, implement and promote outer space related systems and projects. Among other activities the Authority's Board of Supervisors and Executive Director will be responsible for developing a business plan, negotiating with federal agencies for control of existing assets and property, and generally directing the administration of the commercialization of outer space in Florida. Also provided in the Act are provisions for residential mathematics and science honor high schools as well as incubator facilities for eligible small business concerns.

Specifically, the Act provides that the Authority will be overseen by a seven regular member Board of Supervisors (Board) who will be appointed by the Governor and two ex officio non-voting members of the legislature. The regular members of the Board will be residents of the state and have experience in the aerospace or commercial space industry or in finance or have other significant relevant experience. One regular member will represent organized labor interests and another will represent minority interests. The Board will have the power to adopt by-laws and rules, appoint an executive director, plan, have exclusive power to operate and regulate Spaceports, and develop as necessary or desirable those activities and projects which will facilitate the commercialization of outer space as provided by the Act (secs. 5, 10-21, 23-24, 31, 37, 40-42).

The Act specifies designated areas within Florida that will be considered Spaceport territories (sec. 4). Much of the land within the territories is federally controlled. Negotiations for the use of the land will be undertaken by the Authority to gain access and control of the areas designated. It is here that the spaceport launch facilities and support systems will be located. Within these areas the Authority will have broad powers to develop facilities upon certain specific conditions (secs. 5, 7 & 59). At the west coast site at Cape San Blas, rocket launches will be limited to small sounding rocket and other suborbital craft. At the east coast site at Cape Canaveral, the Authority initially may authorize the launching of low earth-orbit rockets (sec. 59). Further expansion of the launch capabilities and general powers will be determined through an assessment by the 1990 legislature of a detailed business plan and other considerations (secs. 5 & 59).

The Act also provides tax exemptions for space-related industry and Spaceport activities. For example, sales, rental, use, consumption, distribution, and storage sales tax exemptions are provided for industrial machinery and equipment purchased for exclusive spaceport activities of new or expanding businesses. Provisions are also included for specific tax

exemptions for space-related payloads and other components and systems intended for space flight. The economic impact of these tax credits is indeterminate. Since commercial space activity at the state level is a new concept; the tax exemptions relate to new activities not presently generating state revenue. It is anticipated that the tax exemptions will have a positive, stimulative effect on space related Florida businesses and industries.

In the first year of operation, the Authority has the power, upon proper approval, to issue a total of 210 million dollars of revenue bonds (secs. 5(u), 35-54). The Authority will submit to the legislature a portfolio of proposed bonding projects, along with the aforementioned business plan, prior to the 1990 legislative session. Subsequent to the legislative authorization, the issuance of revenue bonds may be secured by or payable from the gross or net pledge of revenues to be derived from any project or combinations of projects and from the rates, fees, tolls, fares, or other charges to be collected from the users of any projects (sec. 35). Bonds issued by the Authority are not secured by the full faith and credit of the State (sec. 38).

Sovereign immunity is provided to the Authority in the same manner and extent as the state claims under the Constitution of the State of Florida (sec. 32). If it is anticipated that the Authority will find its own underwriters for insurance coverage. The Act provides that neither the Florida Fire Insurance Trust Fund or Florida Casualty Insurance Risk Management Trust Fund will insure the Authority. The Authority is directed not to seek assistance of the Florida Department of Insurance in consideration, adjustment, and settlement of any claim under section 768.28 of the Florida Statutes (sec. 55). A loss prevention program will be developed and implemented by the Authority (sec. 54).

The Spaceport concept and the commercialization of space, generally has the potential for providing a positive impact on any economy. Opportunities for businesses to develop are created, economic stability is promoted, and new high tech job-producing industry can be expected to be attracted. In order to be successful, any new enterprise must build a strong foundation while remaining flexible and responsive. It is anticipated that the commercialization of the space industry in Florida will help strengthen the economy and position the state for the 21st Century by developing an integrated business structure around the Spaceport territories. Hopefully, these businesses will help attract and retain the best and the brightest students and graduates from without and within the state. Further development of Florida's commercialization and privatization of space will hinge on a review of the forthcoming detailed business plan and certain political considerations.

James Dennis Leary, Jr., Staff Attorney
Florida House of Representatives
Committee on Science, Industry & Technology

Short Accounts

Launch of the European Centre for Space Law

On 12 May 1989, at ESA Headquarters in Paris, the European Centre for Space Law (ECSL) was formally inaugurated.

The Centre will bridge the gap between the important technological progress made over the past years and the need for legal means to control this progress.

For instance, massive projects like the European spaceplane Hermes and the Columbus Programme's contribution to the International Space Station are posing legal questions on a new scale. Also, the complexities of regulating transnational aspects of telecommunications satellites in Europe urgently need to be addressed coherently.

Therefore, in 1988, ESA took the initiative, under the leadership of ESA's Legal Adviser, *Mr. Gabriel Lafferranderie*, in proposing a European Centre for Space Law as a means to strengthen Europe's space law research profile.

Supported by representatives of ESA's Member States, academics, space organizations, industry, and private practitioners, the ECSL came into operation on 12 May, subject to definitive approval by ESA's delegate bodies for ESA. It will function with an administrative unit at ESA Headquarters and through a network of national points of contact (NPOCs).

Opening the meeting, ESA's Director General, *Prof. Reimar Lust* recalled that ESA has "a long history of utilizing the technical and intellectual resources at its disposal to foster space-related communities where only isolated groups existed before" and stressed the significance of setting up the ECSL partnership to promote inter-disciplinary dialogue among lawyers, engineers, economists, and scientists.

ESA laid the groundwork for ECSL by:

- setting up an electronic space-law database (ESALEX) to serve legal academics and practitioners across Europe over ESA-IRS (Information Retrieval Service, and,
- publishing the first (colour) newsletter of the Centre (ECSL NEWS) in April 1989.

ECSL national members (especially Cologne and Leyden Universities' air and space law institutes) provided inputs to both projects.

ESALEX, in particular, will allow the Centre to become, in the words of ESALEX project responsible, *Mr. Kevin Madders*, "Europe's powerhouse of ideas on space law," when associated with an ambitious ECSL research programme. Present candidates for this programme include

satellite-data-rights protection, intellectual property rights in space, and legal means to assist in the flow of data for environmental protection.

The ECSL is a European venture. Membership is open to interested persons within any ESA Member State territory who hold an ESA Member State's nationality or are permanently resident in an ESA Member State and who are not employed by non-European firms or other entities.

Application forms for membership and other information are available from: Mrs. E. Vermeer, ECSL, 8/10 rue Mario Nikis 75738 - PARIS CEDEX 15 (France).

G. Lafferranderie, Legal Adviser,
European Space Agency

"Hawaii: Spaceport for the Future," Meeting of the Aerospace Law Committee of the ABA International Law Section, Honolulu, August 5, 1989

During the American Bar Association Convention on August 6, 1989 in Honolulu, the Aerospace Law Committee of the International Law Section presented a panel discussion on spaceports and the role that the state of Hawaii might have in the development of the first commercial spaceport in the United States. The program was moderated by the committee chairman, F. Kenneth Schwetje, and the principle speakers were Mr. George Mead, Director of the Hawaiian Office of Space Development, and Mr. Gerald Musarra, Counsel to the Department of Transportation's Office of Space Transportation in Washington, D.C.

The National Space Policy announced in February 1988 and the 1988 Amendments to the Commercial Space Launch Act of 1984 encourage a robust commercial space launch industry in the United States. Such efforts were not economically attractive while NASA was the primary launch provider for all U.S. payloads. Of course, that situation changed in 1986 when the U.S. space program suffered the tragic loss of the Challenger. A major shift in the government's attitude toward commercial space launches took place after this accident. NASA would no longer serve as the primary access to space for the majority of U.S. payloads. The nascent space launch industry has been presented with two options to facilitate the need for launch services. The simple, obvious answer has been for the large aerospace corporations to step into the shoes of NASA, use boosters originally designed for sale to the Air Force or NASA, use government complexes to launch the payloads, and thereby continue the routine access to space demanded by the owners of space objects. This method works well for multimillion dollar satellites which were backlogged after the Challenger accident. It is, however, still subject to a myriad of government regulations, schedule uncertainty as high priority government payloads "bump" civilian systems, and a relatively high cost per launch.

This last factor especially has focused interest on the second option, a totally civilian launch facility for small payloads. Proposals for

these "spaceports" have common characteristics: they are near the equator to reduce the amount of energy necessary to achieve orbit and they have sufficient ocean areas near them to lessen the risk that populated areas will be at risk during the conduct of operations. Two states are serious contenders for such a facility--Florida and Hawaii. International competition is being provided by the Cape York project in Australia.

During the ABA program, *George Mead* described the benefits of locating such a spaceport on the island of Hawaii at the most southern point in the United States, South Point. Not only is the latitude suitable to optimize fuel saving but no other site in the world permits launches on as many azimuths as South Point. *Mr. Musarra* followed this informative presentation with a discussion of the federal licensing requirements associated with the development of such a spaceport.

Spaceports, especially those designed for small payloads, may be faced with competition from innovative solutions to the problem of how to orbit these satellites. The Pegasus air-launched booster designed by Orbital Sciences and a modification of Soviet mobile military boosters being marketed by Space Commerce Corporation both provide attractive alternatives to a fixed, land-based launch facility. Whatever the outcome of the search for low cost access to space, it proves to be an interesting area of study for the students and practitioners of space law.

"The Law and Outer Space," First Annual Symposium, Sept. 8-9, 1989

The first annual symposium on the Law and Outer Space was held on September 8-9, 1989, in Washington, D.C., at the Georgetown University Law Center. *John T. Stewart, Jr.* from the law firm of Zuckert, Scoutt & Rasenberger directed the symposium and *Paul B. Larsen*, adjunct professor at Georgetown University Law Center, served as program coordinator.

After a welcome by *Mr. Stewart*, *Mr. Craig Covault*, senior editor from *Aviation Week and Space Technology*, spoke of recent developments and future challenges of commercial space activities, advocating that science and technology planning of the United States be restructured to further commercialization efforts of the United States.

The first panel focused on private property rights. Panel Chair *E. Tazewell Ellett*, a partner with Hogan & Hartson and former Chief Counsel to the Federal Aviation Administration, predicted that private space operations will eventually dominate. *Ellett* noted that lawyers with commercial and contracts expertise, instead of regulatory expertise would be necessary because of questions, such as how to protect preexisting or newly acquired property rights in space or how to finance risky space ventures. The first panelist, *Raymond Vickery, Jr.*, also a partner with Hogan & Hartson, spoke of the necessity of protecting in outer space a company's trade secrets, patents, copyrights, and trademarks. Protecting these four types of intellectual property internationally could pose challenges because, for example, (i) some countries do not recognize trade

secrets, but rather treat them as a branch of contract law; and (ii) patents, if on sale for more than one year cannot be patentable in the United States. The panel's second speaker, *Ann E. Flowers*, an associate at Hogan & Hartson, described her representation of Payload Systems, Inc., in negotiating the first commercial space venture between the U.S. and the U.S.S.R., the sending of a U.S. company's payload to the Soviet MIR orbiting space station. She outlined the numerous regulatory hurdles that had to be overcome, such as the fact that any exchange of information with a foreign launch company in or outside the United States could necessitate an export license and that accurate minutes of any exchange of technical data must be kept. She noted that one of the most difficult problems was ensuring the protection of proprietary information, when, on one hand, the Soviets cannot take the risk of placing an unknown payload on MIR and, on the other hand, insurance companies do not want to insure Payload Systems for any destruction that may occur to MIR, a seemingly unlimited risk.

The panel's last speaker, *Neil Hosenball*, a partner with the law firm of Davis, Graham & Stubbs and a former General Counsel of NASA, addressed issues of financing space ventures. *Mr. Hosenball* mentioned a number of factors affecting the ability to obtain financing: (i) technical risks (whether the product will meet operational requirements, NASA interface and safety requirements, and cost limitations); (ii) market risks (whether there will be an adequate rate of return, whether the sales prices will be at a level to attract consumers, the amount of competition, the government's market share); (iii) whether the product is dependent on shuttle transportation; and (iv) whether the appropriate governmental approvals have been negotiated. He also discussed what a space venture would need in order to enter into a Credit Agreement, how a security interest on space ventures or products could be perfected, and the various types of insurance.

John O' Brien, Assistant Deputy Administrator of NASA, served as moderator of the panel addressing liability and insurance issues. The panel's first speaker, *Edward A. Frankle*, General Counsel of NASA since July 1988, discussed liability for damage resulting from government space operations, focusing in particular on cross-waiver of liability provisions, noting that these provisions are being used with increasing frequency. The provisions stipulate that the U.S. waive its right to sue the contracting party for any damage to U.S. property in return for the contracting party waiving its rights against the U.S. Not only are the cross-waiver of liability provisions incorporated into international agreements, such as the Space Station Agreement, but the provisions are also included in agreements relating to the Space Shuttle. Additionally, the 1988 Commercial Space Launch Act Amendments ("1988 Amendments") provide for cross-waivers above the minimum insurance level required by the Act. In many cross-waiver of liability provisions, the provisions will apply at every tier of the contract. Although it is still unclear how the cross-waivers will function, there has been one recent case from the California

Court of Appeals in August 1989 enforcing a cross-waiver of liability provision.

After *Frankle's* speech, *Courtney A. Stadd*, former director of the Department of Transportation's commercial space transportation office and now a commercial space consultant, gave his perspective on regulations of commercial space launching, focusing specifically on how the Department of Transportation developed the guidelines (incorporated into the 1988 Amendments) for balancing insurance and liability issues to aid the fledgling rocket industry. The third panelist was *Peter D. Nesgos*, a partner of Haight, Gardner, Poor & Haven. He described the challenges facing the private practitioner, which include, *inter alia*, the following: (i) risk management advising; and (ii) educating a commercial company about risks of third party liability because most first and second party liability is avoided through cross-waivers of liability.

The third panel of the day focused on contractual issues with *Paul Dembling*, a partner with Schnader, Harrison, Segal & Lewis and a former General Counsel to NASA, serving as moderator. *Jim R. Myers*, a partner at Robbins & Laramie, offered advice on creating favorable governmental contracts. The second speaker was *Robert J. Wojtal* from NASA's Office of the General Counsel. *Mr. Wojtal* addressed private party contracts, focusing his presentation, in part, on launch services and insurance issues. The last speaker, *Ralph L. Kissick*, a partner with Zuckert, Scoutt & Rasenberger, spoke of the differences between Air Force and NASA launch contracts; some of the issues mentioned were as follows: (i) terms of the contract (NASA enters into individual user contracts, with the terms of the contract varying from user to user, while the Air Force follows a "Model Expendable Launch Vehicle Commercialization Agreement" for all contracts); (ii) dispute settlement provisions (NASA's process generally lasts longer than that of the Air Force); (iii) limitations of liability provisions (NASA's contracts, unlike those of the Air Force, limit its liability); (iv) remedies for breaches; and (v) penalties for termination by the user (NASA allows for partial termination, while the Air Force only permits complete termination).

The fourth and last panel of the day focused on governmental requirements such as licensing, the impact of government behavior on financing, and legislative initiatives for encouraging private activity. After *Irene Elizabeth Howie*, assistant chief counsel to the Federal Aviation Administration introduced the topic and panelists, *Stephanie Lee-Miller*, Director of the Office of Commercial Space Transportation at the Department of Transportation, addressed the topic of licensing. Then, *Jerome Simonoff*, Vice-President of Citicorp, N.Y., addressed the impact of governmental behavior on financing and offered a number of ways in which the government could stimulate investment; among them were: (i) the procurement of launch services commercially; (ii) the purchase of insurance commercially; (iii) the buying of "commercially available" equipment; (iv) the awarding of short-term contracts to commercial

companies, contingent on the project progressing in a certain way, so companies would have an incentive to engage in "risky" and time-consuming projects; (v) the offering of insurance at a high rate to those companies unable to acquire commercial insurance; and (vi) the complementing of governmental investment efforts with private industry. The final panelist of the day, *Lillian M. Trippett*, director at Martin Marietta Corporation of General Legislation and former counsel to the Subcommittee on Space Science and Applications of the Committee on Science, Space, and Technology in the U.S. House of Representatives, discussed recent and developing legislative initiatives to encourage private activity. She summarized the history of the 1988 Amendments and addressed China's recent entry into the international launch market and the U.S.S.R.'s efforts to provide launch services to western companies. She also reflected on the reasons for the U.S. government's different treatment of the two governments. Of particular interest was *Ms. Trippett's* discussion of a bill giving NASA a leading role in ensuring access to space for non-aerospace entrepreneurs interested in exploring the space environment for manufacturing new products and processes.

Katherine M. Gorove
Assistant Professor of Law
University of Mississippi Law Center

The 6th Seminar of the Lawyers within the Framework of the "Intercosmos" Program, Moscow, September 25-29, 1989.

According to the Agreement on cooperation in exploration and use of outer space for peaceful purposes of 1976, which serves as the legal foundation for carrying out all activities under the "Intercosmos" program, in order to fulfill the task of the Agreement, the parties may *inter alia* organize conferences, seminars, and other forums. A significant role in the development of cooperation in the field of space law is played by regular seminars on space law. The first seminar took place in 1979 in Warsaw, Poland and the sixth one in Moscow, USSR in 1989. The lawyers from Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland and the USSR took part in the work of the sixth seminar.

The agenda of the seminar embraced two main topics, besides miscellaneous items. The first theme was connected with the analysis of the state of affairs and possible directions in the development of the legal status of the "Intercosmos" program. This theme also included papers and discussion on the question of national legislation in the socialist countries from the viewpoint of its regulatory functions in the field of cooperation in exploration and use of outer space. Significant changes in economic legislation of many socialist countries and the tendency to broaden rights and responsibilities of state enterprises inevitably influence the mechanisms of their cooperation in outer space. It was underlined that one

of the most important tasks for the immediate future would be the strengthening of direct legal and economic ties between first-hand participants in some programs or scientific experiments and the improvement of the legal basis for these contacts. These relations should be better regulated through the implementation of multilateral and bilateral treaties between participating countries on industrial and trade cooperation, and also through the use of existing norms in the civil and commercial fields of domestic legal systems.

Special attention at the seminar was given to the problem of determining the particular regime of use and the protection of the results of scientific investigations carried out under the Program.

The general conclusion was that the various relations between parties of the Program must more completely correspond to the specific interests of all parties and, in particular, it is necessary to expand the sphere of application of the principle of reimbursement. Therefore, it was recommended to conclude the main part of the contracts directly between the enterprises involved and use proven mechanisms of civil law.

Next, the problem of the legal future of the "Intercosmos" program was under consideration. Two possible alternative decisions were considered: first, to find out new opportunities for the future cooperation on the basis of existing Program without considerable changes of its legal structure and second, to transform this Program into some kind of international organization as, for instance, the European Space Agency. The delegates mutually agreed that the "Intercosmos" program was the proper form, providing sufficient legal basis for cooperation which had great potential reserves to satisfy the national needs in exploration of outer space. The views were expressed that any discussion on the possible changes of legal mechanism of cooperation, particularly discussions on the creation of international organization on the basis of the Program, would be useful only if there were necessary preconditions having, first of all, scientific, technical, and economic character.

As for national legislation, it was stated that there were no special laws on outer space in participating countries. It was stressed that it would be advisable to conduct an investigation of the problem of the possibility and necessity of national regulation of space activities. According to one opinion, in the absence of special national space law, space activities should be governed by general norms of national legal systems.

Several papers dealt with the problem of so-called private international space law. The emergence of private international space law is connected with the involvement of persons and various nongovernmental legal entities in space activities. It is also connected with the increasing commercial use of outer space. This concept of private international space law will not be something entirely new but, rather, it will be based on traditional private international law with some modifications caused by the specific features of space activities. At the same time, public

international space law will continue to play a leading role in legal relations.

Basically, the second part of the seminar was devoted to a discussion of a wide spectrum of space law problems which were under consideration in COPUOS and other UN forums. Unfortunately, it is not possible to describe this discussion in detail. However, a synopsis of the discussion is provided here. Many speakers expressed their convictions that it was necessary to formulate and adopt special norms, or even a whole convention in order to promote environmental protection of outer space and the Earth. Several lawyers spoke on the number of complicated problems connected with the new COPUOS agenda item. Attention was focused on different interpretations by some governments and lawyers of the important provisions of Article I of the Outer Space Treaty of 1967 concerning the exploration and use of outer space for the benefit of the whole mankind. The spectrum of interpretations of Article I is very wide. Therefore, it is necessary to find out the proper meaning of this provision in order to avoid potential conflicts.

Several papers were devoted to the problem of using nuclear power sources in outer space. Some other questions were also touched upon.

The Seminar approved several practical suggestions. The participants decided to provide each other with information about those national organizations and enterprises which were authorized to enter into direct relations with foreign juridical persons in the course of exercising their responsibilities under the "Intercosmos" program. They also recommended to send information to COPUOS about the state and prospects of national regulation of space activities, organize a center on space law for the participation of all members of the "Intercosmos" program, and give working group status to this Seminar of lawyers.

In a preliminary manner, the Polish delegation invited all participants to hold the next seminar in Warsaw, Poland in 1991.

G. Silvestrov

Institute of State and Law, USSR Academy of Sciences

"Space Without Weapons," Symposium held at McGill University, 25-27 October 1989

Again this year, the Symposium organized by the Centre for Research in Air and Space Law at McGill University in Montreal, in association with the Department of External Affairs of Canada, provided a unique forum for interdisciplinary discussion among leading experts on space technology, military uses, and international law. It was the third symposium of its kind.¹

1. For the two previous symposia, see *AN ARMS RACE IN OUTER SPACE: COULD TREATIES PREVENT IT?* (N.M. Matte ed. 1985) and *SPACE SURVEILLANCE FOR ARMS CONTROL AND VERIFICATION: OPTIONS* (N.M. Matte ed. 1987).

The first panel this year was devoted to the question "Weapons and Harm." *Mr. Hughes* from Dynacon, a Canadian company engaged in high technology hardware, proposed a methodology for the classification and verification of space craft. In contrast to *Hughes'* view that formulating such a methodology would not encounter major obstacles from a technical point of view, *Mr. Pilat* from the Center for National Security Studies at the Los Alamos National Laboratories in the United States, pointed to the difficulties in differentiating harmless space objects from aggressive and potentially harmful ones. In view of the stabilizing effect of certain military observation satellites, *Mr. Pilat* did not favour the demilitarization of activities in outer space.

Professor Stephen Gorove of the University of Mississippi Law Center accentuated the need for clear definitions of the terms used in the treaties and agreements pertaining to outer space. Apart from the ever open question of the delimitation of air space from outer space, the meaning of certain basic terms such as weapon, harm, weapons of mass destruction, harmful interference, *etc.* has not yet been settled.

The panel concerned with "verification" was dominated by Canadians -- probably a reflection of Canada's longstanding interest in outer space and of its commitment to disarmament. Speaking on logistic problems of verification, *Mr. Gubby* from Telesat Canada, a mixed Canadian enterprise for telecommunications by satellite, mentioned the inspectorate of the International Atomic Energy Agency in Vienna as a possible model for the verification of outer space objects. *Mr. Stibrany* and *Mr. MacKinnon*, both of the Department of External Affairs of Canada, presented the political aspects of weapons in space, in particular the linkage to arms control and disarmament.

In her presentation, *Dr. Stojak* from the Centre for Research in Air and Space Law put the issues raised by the preceding speakers on verification, into an historic perspective. Her analysis was based on legal arguments. She felt that existing treaties and agreements are adequate to the task of solving a great number of currently pending questions, and that amendments to existing laws are not necessarily required. What is needed is the political will of the parties concerned to fill the existing treaty provisions with life.

Dr. Osborne from Spar Aerospace, a Canadian company engaged in building satellites, was the first speaker of the third panel entitled "Current Situation." He gave an overview of the state-of-the-art in space technology. While acknowledging the military usefulness of satellites for purposes of observation or even combat support for ground forces, he did not see much sense in the development of new weapon systems for use in outer space. Such weaponry would be extremely costly and would be an easy target for the enemy in case of a conflict.

According to *General Gallois*,² it is not the quantity of weapons that is a deterrent but their potential for mass destruction. Once in the possession of such weaponry, the development of new systems cannot serve to increase security of the big powers. *General Gallois* contended that the only justification for developing outer space weaponry could be to prevent the proliferation of such technology to third countries, *i.e.*, the big powers assume the role of a world gendarme.

Professor Almond from the United States National Defense University dealt in detail with the dilemma created by the apparently contradicting provisions of the United Nations Charter on the settlement of conflicts by peaceful means. While under the provisions of Article 2(4) of the Charter a new public order has been established which does not allow the States to use force for settling international disputes, the provisions of Article 51 of the Charter still gives the same States the right of self-defense.

Colonel Fenrick of the Department of National Defense of Canada stated that weaponry in outer space are conceived by the United States military as a force multiplier. However, in line with other speakers, he considers space weapons as highly vulnerable as they would constitute ideal targets in case of a conflict.

The last panel was devoted to "Looking Ahead," and here the two underlying approaches, which had been evident in previous presentations, found their advocates. *Dr. Agaev*, Acting Director of the Department of International Organizations at the Soviet Ministry of Foreign Affairs, presented an optimistic and constructive point of view. He favored greater transparency in space activities as a confidence building measure. In his view, the early warning system is a stabilizing factor in international relations. The Soviet initial reaction to the American SDI programme was rather "emotional," he said, and postulating a linkage between SDI and disarmament had been unnecessary. *Dr. Agaev* felt that the superpowers had a responsibility to prevent the proliferation of missile technology to States which are "unpredictable in internal and external terms."

In contrast, *Mr. Stares* of the Brookings Institution in the United States raised a word of caution in respect of the euphoria created by the current dialogue between the superpowers. He enumerated the various projects for the development of space weaponry, including target support for ground forces, by both the US and the USSR. He pointed out that the existing observation satellites, which are widely accepted as a stabilizing factor, are not as benign as we wish to think, and that present developments indicate a destabilizing trend.

Professor Dupuy of the College de France, the "Doyen" of the speakers, gave a socio-philosophical interpretation of the issues discussed at this symposium. He appealed to the statesmen of the world to seize this

2. Director of the Institut International d'Etudes Geopolitiques, France. He was a Strategic Advisor of General de Gaulle and an adviser at the NATO Supreme Headquarters Allied Powers, Europe.

golden opportunity of new dialogue and confidence building between the two superpowers to encourage them to go beyond bilateralism and make substantial multilateral progress in ensuring the peaceful uses of outer space.

It is hoped that the lively discussion which ensued during the question period, will be included unabridged in the Proceedings to be published soon at McGill University.

Jochen Erler

Formerly, University of Heidelberg

Report on the Colloquium on Manned Space Stations - Legal Issues, Paris, France, November 7-8, 1989.

In commemoration of its 30th Anniversary, the Working Group on Space Law of the Institute of Comparative Law at the University of Paris II, in conjunction with the French Centre National de la Recherche Scientifique (CNRS), organized on 7 and 8 November 1989 an International Colloquium in Paris (France). The European Space Agency (ESA) and the French Centre National d'Etudes Spatiales (CNES) supported the organization of this Colloquium which was devoted to the study of Legal issues arising out of the Programs of Manned Space Stations currently under way in the USSR and the USA.

In the first session, under the Chairmanship of *Judge Gilbert Guillaume*, a member of the International Court of Justice, some general issues were discussed. First, in order to provide the attendants with the necessary background, *Jean-Jacques Dordain* (ESA) gave a general overview of the technical characteristics and the functions of the various types of space stations, *i.e.*, MIR in the USSR and FREEDOM in the USA. From the same general point of view, *Prof. Stephen Gorove* (USA) elaborated on the notions of "Space Objects," and "Jurisdiction and Control" which appear in space law, as it stands at present on the basis of the Outer Space Treaty of 1967 and other agreements, including the Intergovernmental Space Station Agreement of September 29, 1988.

Then *Prof. K.H. Bockstiegel* (FRG) took the chair for the second session on Programs. *V.S. Vereshchetin* (USSR) spoke on the management and utilization of the USSR space station MIR, which is part of a national space program despite the fact that some foreign cosmonauts are allowed on the station.

Unlike MIR, the American space station FREEDOM is part of a large international program conceived within a very peculiar legal framework. This framework was depicted by *R. Loosch* (FRG), one of the negotiators of the Intergovernmental Agreement (IGA) of September 29, 1988 by the governments of the USA, Canada, Japan, and several European countries members of ESA.

K. Madders explained the concept of "Partnership" and the notion of international management which are to be found in the IGA, while *Simone Courteix* (CNRS) described the conditions of access to and utilization of the Space Station, and *Michel Bourelly* (France) spoke on the problems of liability for damage in relation with that Station.

The third session of the Colloquium under the Chairmanship of *Dr. I. Diederiks-Verschoor* (The Netherlands) dealt with the topic of "Human work in Space."

The Astronaut's Legal Status was discussed by *Prof A. Gorbiel* (Poland) in the case of national stations and by *J. Reifarh* (FRG) in the case of international stations. Then, *Mr. P. Fauteux* (Canada) - for *M.P. Dubois* - considered the case of transborder movements of goods, persons and technologies which are necessary for construction and operation of space stations.

The fourth and last session of the Colloquium was devoted to "Production Activities in Space" and *Mr. Izumi* (Japan) was in the chair. The matter of protection and exploitation of innovation was dealt with by three speakers: the first one, *M.J.P. Raynaud* (France), gave the user's viewpoint, the second one, *M.D. Stauder*, explained the problems posed by current patent laws and agreements while the third one, *M.F. Murphy* (France) suggested some possible solutions.

In the absence of *Dean C.A. Colliard*, Director of the Working Group on Space Law, who unfortunately was ill, some closing remarks on the reports to the Colloquium and on the very vivid discussions which took place between the rapporteurs and the audience were presented by ESA's Legal Adviser, *G. Lafferranderie*.

G. Lafferranderie pointed out that some characteristics of national or international space stations - in particular their long stay in orbit and the fact that they are inhabited - make them different from other space objects. Therefore, one should consider whether space law, as it stands now, can respond to the demands of this new type of human activity in outer space.

He was of the opinion that an affirmative answer can be given because most of the problems which have been identified (in particular during the negotiations of the IGA) have been solved by reference to the Outer Space Treaty and other international agreements based on that Treaty.

G. Lafferranderie noted however that a common opinion was expressed by almost all the participants, *i.e.*, that in addition to the existing international agreements and national legislation, it would be useful and even necessary to draft some new international or national rules. These rules would help in solving several specific problems arising in connection with space stations, for instance, in the field of registration, jurisdiction and control, liability, status of astronauts, and intellectual property rights.

As a final remark, *G. Lafferranderie* expressed the hope that a another Colloquium could be organized at a later stage in order to continue and deepen the fruitful exchange of views which has now come to its end.

Michel Bourely
Former Legal Adviser
European Space Agency

"Open Skies" Workshop, November 21-24, Ottawa, Canada

On November 21-24, 1989, an "Open Skies" Workshop was held at the National Arts Centre in Ottawa, Canada. The Workshop was sponsored by the Verification Research Unit of the External Affairs Department of the Canadian Government and International Trade Canada, and York University of Toronto. The Workshop involved participants from governments, organizations, corporations, and the academia. The four sessions dealt with the technical, operational and organizational, legal and political aspects of a potential Open Skies regime. The Open Skies regime being considered would involve aerial overflight of each other's countries by the United States, Canada, Western and Eastern Europe, and the Soviet Union.

The Session on Legal aspects of Open Skies was chaired by *Professor David Leyton-Brown*, Associate Director of the York Centre for International and Strategic Studies. *Mr. Jason Reiskind* of the Legal Operation Division of External Affairs gave an overview of the international legal instruments which are relevant to Open Skies, including the Chicago Convention and the IATA and IASTA rules. He suggested that precedent for aerial inspection would be found in the United Nations peacekeeping operations, the IAEA inspection system, and the Status of Forces Agreements between states.

Dr. Lucy Stojak of the Centre for Research in Air and Space Law, McGill University compared the legal aspects of outer space observation of the earth with those of aerial inspection. She compared customary freedom of use of outer space with territorial jurisdiction over airspace. She discussed the aerial overflight provisions of the Stockholm Agreement and noted the legal questions which had arisen in the United States over a possible Mediasat.

Addressing the legal aspects of the acquisition and dissemination of data acquired by aerial overflight was *Professor Colleen D. Sullivan* of Villanova University. She also discussed the conceptual and practical aspects of establishing an Open Skies regime and an international agency, suggesting that use might be made of existing international organizations. *Professor Sullivan* suggested some other legal issues which might arise in Open Skies, including liability and the role of the Neutral and Non-Aligned States.

On February 12-14, 1990, the NATO and WTO governments will be meeting in Ottawa, Canada to draft an Open Skies treaty. A second

governmental meeting will take place, probably in Eastern Europe, with the timing depending on the results of the Ottawa meeting,

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Other Events

The American Institute of Aeronautics and Astronautics and NASA jointly sponsored an International Space Station Technical Symposium, June 20-22, 1989, in Vienna, Virginia.

Topics for discussion at the Third Space Enterprise Conference, entitled "Lunar Conference - Building the Earth Space Bridge," (San Francisco, Oct. 1-3, 1989), included the establishment of a lunar infrastructure, issues of its financing, and aspects relating to politics, law, and international cooperation.

Brief News

U.S. spy satellites may be used in war on drugs . . . Twenty-eight commercial launches are planned by the U.S. between now and mid-1993. . . NASA is developing a bioregenerative life support system to supply air, water, and nutrients to space crews on long duration missions . . . NASA releases initial plans for manned missions to the Moon and Mars with shuttle derived C and Z variations . . . Satellites of Energetics Satellite Corp. is to be launched aboard the Soviet Proton . . . Private enterprise is concerned that their efforts will be undercut by the government allowing foreign rivals, particularly the Soviets and Chinese, to launch Western payloads . . . A NASA expert notes that floating space debris may create problems in operating the planned U.S. space station . . . Court of Appeals denies insurance companies lawsuit against manufacturer for WESTAR 6 booster failure . . . Voyager makes its closest approach to Neptune discovering that the planet's moon Titan may have dry land continents, as well as methane oceans . . . NASA's Hubble Space Telescope is currently under final inspection so that the March 1990 launch date can be met . . . A private non-profit Princeton, New Jersey, group wishes to send a space probe, composed of left-over Apollo parts, to orbit the moon . . . President Bush backs a manned return to the moon some time after the year 2000.

Soviets offer use of Energia booster to NASA for space station construction. They expect to double payload weight and place record satellites in orbit by 1994. They are to begin an aggressive unmanned exploration of Venus and Mars. They also plan large scale expansion of the MIR space station over the next five months. Two building block modules, equal in size to the original MIR, will be added this year with two more being added next year . . . The Soviet space shuttle's first manned flight is

expected in 1992 . . . The French reach agreement with the Soviets on joint MIR mission . . . Soviets discussed plans for joint development of an aerospace plane with Japan . . . A Japanese astronaut is expected to report live from Soviet MIR space station in 1991 . . . A British astronaut is to fly aboard the scheduled Soviet shuttle flight.

Brazil's space launch program may start as early as 1992 . . . Germany announces establishment of a national space agency . . . India is to launch a polar satellite launch vehicle next year . . . A Scandinavian communications satellite was launched by ESA's Ariane rocket . . . Arianespace plans first launch of the air-launched Pegasus rocket . . . EUTELSAT begins preliminary negotiations with Eastern-Block countries for satellite communication services . . . A consortium of U.S., French, and Italian companies plans to develop a retrievable space platform . . . A group of European countries are supporting the development of a West German two-stage aerospace plane . . . Spanish government approves 370 million dollars for first three communications satellites . . . Japan plans unmanned free-flier unit launch in 1992 . . . Israel plans launch of a second satellite . . . A Swiss scientist has proposed the building of a giant space umbrella, half the size of the U.S., to cool the greenhouse effect.

The Galileo spacecraft, launched on October 12, 1989 aboard the space shuttle Atlantis, will attempt to take a close-up look at asteroids and shed light on the "Big-Bang" theory of the creation of the universe. After its planned arrival in December 1995 at Jupiter, it will study the planet's 16 moons. A request by anti-nuclear groups to halt the launch, alleging that Galileo's plutonium power plant posed too much of a threat to the public, was denied by the court . . . SOLAR MAX ended its useful life and plunged into the earth's atmosphere.

B. FORTHCOMING EVENTS

During the 1990 Annual Meeting of the American Society of International Law, the Society's Space Law Interest Group plans to discuss current space law issues.

The 33rd International Colloquium on the Law of Outer Space will take place in Dresden, German Democratic Republic, during the week of October 6-13, 1990. Topics for discussion include: (1) The legal implications of space commercialization; (2) Space activities and the legal aspects of protection of the global environment; (3) Recent developments in space law; and (4) Other legal subjects.

BOOK REVIEWS/NOTICES

Reviews

International Space Policy: Legal, Economic, and Strategic Options For The Twentieth Century and Beyond, edited by Daniel S. Papp and John R. McIntyre (Quorum Books, New York, 1987), pp. 328.

This book is a collection of papers presented at a conference convened in May 1985 at the Georgia Institute of Technology. The editors were the conference organizers. The purpose of the conference was to create a forum for scholars and practitioners concerned with the human movement into space to exchange their views regarding current policy issues. The papers were updated in 1987. The editors have done a good job of covering a range of issues.

Some of the pieces consider important topics that are very often addressed alone but seldom in tandem. One example is an article by *Aaron Karp*, "The Commercialization of Space Technology and the Spread of Ballistic Missiles." *Mr. Karp* discusses the U.S. push to commercially develop its launch industry within the context of space programs in developing countries. He sets out a brief history, identifies some of the connections between them, and suggests an international missile technology regime as a first step to controlling an "incipient arms race." *Mr. Karp* has set out an admirable analysis and makes an excellent case for a multilateral approach to the situation. He proposes an organization whose "membership would include countries with advanced aerospace industries [and which] would agree to cooperate to ensure that missile and space-launch technology is transferred only to those Third World nations with unambiguously peaceful space launch programs." Details of his approach would benefit from input from developing nations as to what is "peaceful" and "unambiguous."

Standing in contrast to *Mr. Karp's* premise that space launch activities are important to national interests is *John Logsdon's* assertion in "Outer Space and International Space Policy: The Rapidly Changing Issues." He states that "[e]xcept for its continuing political value as a symbol of technological capability, most of what is happening today in space is not closely linked to important national interests." In the classroom mill such diverse grist provides well-leavened discussions. It is interesting to note that neither *Mr. Karp* nor *Mr. Logsdon* include the environment within their definitions of "national interests."

Despite the dynamic changes in the field since 1987, many of the articles still raise core issues and present valuable historical background. "High Tech, High Cost: Reasons for Cooperation in Space?" by *Joan Johnson-Freese* is a good example of this category. In her article, *Ms. Johnson-Freese* examines the role of project cost as a motivation for

international cooperation in space. In so doing, she raises the provocative question of whether intra-European cooperation and ESA-NASA cooperation are prompted by the same forces. Her conclusion is that they are not. In support of her analysis, the author provides an excellent synopsis of ESA's emergence from ELDO and ESRO and U.S.-European relations in the Post-Apollo Program.

Moving from the specific to the general, two observations are worth mentioning. It was the editors' goal to bring together a "broad cross-section of expertise [to] make possible a more multidimensional and multidisciplinary treatment of the issues." They have succeeded. However, the addition of more foreign contributors and a section expressly dedicated to space philosophy would have made their efforts rise from successful to striking.

Only one of the sixteen contributing authors was from a country other than the U.S. (West Germany). The collection would have been enhanced by including more foreign views, particularly from the developing nations.

A case can be made for the inclusion of philosophy by considering the language used by the authors in describing their work. Their introduction is titled, "Space . . . the Final Frontier" in which they consider "man and his machines" and "man's effort to conquer space." These words reflect a mind-set that conceptualizes space as a hostile arena and space development as a process in which men (not women) will overpower nature by sheer engineering and scientific prowess. Once the process is completed, the need for innovation will cease. One alternative concept envisions humanity moving through its eternal evolutionary processes and expanding its home to include non-terrestrial locations.

Space technology has brought to light the environmental consequences wrought by the former concept since the beginning of the Industrial Age. An interdisciplinary policy discussion such as the editors of *International Space Policy* provide, coupled with an active consideration of a true philosophy for space activities, can yield many different concepts. Those concepts, if acted upon, could provide a human experience of exploration that is less damaging to our present and future homes as well as the realization that no frontier is truly the final one. There is always a beyond.

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Space - A New Era: Fifth National Space Symposium Proceedings, edited by Allison P. Kinsley (United States Space Foundation, 1989), pp. 275.

This publication covers the proceedings of the Fifth National Space Symposium held on April 4-7, 1989 in Colorado Springs.

The first session was a workshop sponsored by the U.S. Space Foundation. It dealt with the policy implications resulting from the current and future proliferation of space debris and was chaired by *Dr. Ray Williamson* and *Professor William B. Wirin*. The high points included a discussion of the "Technical Phenomena of Space Debris Resulting from Man's Exploration of Outer Space." Among the first speakers, *Darren McKnight* elaborated on the practical implications of the debris issue in light of past, present, and future space activities while *Joseph Loftus* discussed the proliferation of man-made space debris and offered possible solutions. *Professor Stephen Gorove* dealt with the legal aspects of the problem, pointing out that, contrary to the belief of some scholars, there were, at least, five categories of provisions in current international space law relevant to debris. He called for an interdisciplinary approach on the national and international levels to successfully cope with the problem.

Other non-legal sessions included discussions on international cooperation and competition in exploring and using outer space. *Mr. Ian Pryke*, a European Space Agency official, spoke on international cooperation from the European perspective, *Dr. Chen Baosheng* dwelt on China's space program development, and *Dr. Carl Sagan*, astronomist, gave a general discourse on the future of planetary exploration and how this exploration may compel international cooperation in outer space. Also, there was a session on "Military Space Issues" and an "Education Forum."

Commercial Utilization of Outer Space: Legal Aspects, by Hanneke Louise van Traa-Engelman (Drukkerij Haveka B.V., 1989), pp. 316.

This publication is a detailed discourse of the evolution of the commercial utilization of outer space and its legal implications for international space law. The text begins with a historical look at space law and international cooperation in its establishment. The author articulates the correctness and permissibility of the concept of commercialization of space activities in the limited context of the Outer Space Treaty and the Moon Agreement. She goes on to review international cooperation in exploiting outer space for commercial communications and traces ITU's role in the formation of international space law and the regulations of modern communications. Additionally, *van Traa-Engelman*, discusses the six georegional commercial satellite communications organizations that such cooperation has spawned, *viz.*, INTELSAT, INTERSPUTNIK, INMARSAT, EUTELSAT, EUMETSAT, and ARABSAT. She analyzes these organizations by articulating and distinguishing the factors that led to their formation.

Next, the author examines the legal impact that direct broadcast by satellites and remote sensing have had on commercial utilization of outer space and clarifies the ramifications that these technologies will have on the body of international space law. The issues broached by the two technologies are reconciled within the legal framework of intellectual

property. The author sets out what actions must be taken to insure that intellectual property rights are not usurped, and asserts that international cooperation will be a determinative factor in solving any conflicts that may arise.

The last chapters of the book deal with areas that are of current interest. Here, the involvement of private enterprises in space and the resultant effect on space law is examined. Also, the substantial and increasing need for insurance is analyzed in light of the Challenger disaster. Finally, the author rounds out her progressive analysis of the effect of increased commercial utilization of space with an instructive overview of current schemes for the settlement of space law disputes.

The Pollution of Outer Space, In Particular of the Geostationary Orbit, by G. C.M. Reijnen and W. de Graaff (Utrecht Studies in Air and Space Law, Martinus Nijhoff Publishers, 1989), pp. 163.

This book is the fourth volume in a series published as part of the Project on Air and Space Law under the auspices of the Netherlands Institute of Social and Economic Law Research (NISER). The authors focus on the increasing world-wide concern for pollution in outer space by discussing the scientific, policy, and legal aspects.

The authors define pollution very broadly: "all harmful effects of the use of outer space." This definition includes many consequences of satellite launches, i.e., fuel exhaust influencing the Earth's upper atmosphere and the introduction of terrestrial chemical components into an extraterrestrial environment.

Because the book is a study of outer space pollution from three perspectives, the chapters are loosely divided. In the scientific perspective section, the authors analyze the definitions of outer space and the geostationary orbit and review the scientific and technical data regarding space pollution and orbital perturbations. In the policy perspective, the authors consider the political arena as the place where outer space problems (like pollution) can be altered or eliminated. They address the importance of the various types of satellites and speculate about future trends.

In the section dealing with the legal perspective, the major thesis appears to be that international law is not adequately equipped to handle this problem. After examining treaties and other international agreements relating to outer space, the authors conclude that very few possibilities exist to steer or regulate the large amount of environmental pollution. However pessimistic the conclusion, several suggestions are offered for international regulation for the prevention of pollution in outer space.

The latter part of the book is devoted to the role of the International Telecommunication Union and the United Nations in the outer space pollution problem. The authors touch upon the efforts of these organizations and their efforts in light of their present and ideal

effectiveness. By discussing the pollution of outer space from three perspectives, the authors emphasize the importance of a global endeavor to solve the problem: although bilateral and multilateral agreements can help, the effectiveness of a global effort can never be replaced. Annexes accompany the various sections.

Space Debris: Legal and Policy Implications, Howard A. Baker (Nijhoff, 1989), pp.175.

Originally drafted as an LL.M. thesis, *Space Debris: Legal and Policy Implications* considers one of the great dangers to humans in outer space: space debris. In the first part, Baker traces the origins of space debris and defines the risks to human activities caused by potential interference and possible collision. Further discussed are the questions of how debris is detected and what the risk-event probabilities actually are.

The second part opens with an attempt to end the confusion and disagreement about "space objects" and "space refuse" by proposing flexible definitions of both terms. The familiar issues of international responsibility, liability for damage, and jurisdiction and control are then examined as an overture to what the present and future policies concerning them might, or should, hold.

While it is unlikely that *Space Debris* will be the end-all space law desk reference, such was certainly not the intent of the author. On the other hand, the fact that many of the major modern space law issues are culled, coalesced, and examined in the same volume makes *Space Debris* an element to be considered in the personal library of the space or environmental lawyer, law professor, or law student.

Space Shuttle: The Quest Continues, by George Torres (Presidio Press, 1989), pp. 134.

Space Shuttle: The Quest Continues opens with a discussion of the shuttle Challenger's fatal launch on January 26, 1986, manifesting the United States' urgent need to bounce back into the space race in light of the technological competitiveness that now abounds in the frontier of space exploration. The text, complete with exceptional photographs, outlines the Shuttle's dynamic role that links earth to space now and into the next century.

To place the shuttle within its proper phase in the American space program, a brief revisit to NASA's beginnings and a survey of the Mercury, Gemini, Apollo, and Skylab programs is provided. This historical review, placed in the context of an international "space race," furnishes the reader with an extremely informative background. In the author's view, there is a demand for the shuttle, including communication, observation, and military needs, all of which the book depicts as growing at a rapidly accelerating rate.

Recognizing the advent of manufacturing in space and continued scientific exploration of space, the author portrays the shuttle as an instrumental means in America's pursuit to reach beyond earth. However, the book concludes with the notion of the ideal space craft, a single-stage-to-orbit spaceplane, which will be capable of going into orbit under its own power.

Notices

Worldwide Space Law Bibliography Update 1987 and Update 1988, by Kuo Lee Li (De Daro, 1988 & 1989), pp. 206 & pp. 108.

These useful paperback reference books are the first annual supplements to the main volumes of the *Worldwide Space Law Bibliography* published in 1978 and 1987, respectively. The classification scheme used in the main volumes is repeated here, with alphabetized monographic and periodical materials appearing first, followed by documents consisting of agenda items of meetings of the United Nations and international organizations. There are twenty main topics which are further divided into subtopics. Some of the main topics include: space environment; space exploration; sources of space law; safety of space navigation; jurisdiction and control; liability for damage caused by space objects launched into outer space; space telecommunications; meteorological, navigation, and remote sensing satellites; international cooperation in space exploration; international space authority; and the common interests of mankind. A list of abbreviations is included at the beginning, and an authors' index as well as a subject index at the end for further reference.

European Space Directory 1988, by Eurospace (Servig Press, 1988), pp. 528.

This directory is a storehouse of information about the various aspects of European and Canadian participation in the study and exploration of outer space. Here, one can examine profiles of companies, institutions, and people in the space field in both Canada and Europe. Of particular interest is the editorial section where many European scholars and space experts have written articles about Europe's future in space. The topics include infrastructure, projects, programs, budgets, and worldwide reviews of various satellites. Because of its extensive coverage of the Canadian and European space efforts, this directory is a valuable guide for contacts, buying information, scholarly articles, and research in the study of space.

RECENT PUBLICATIONS

A. Books

- BACELLI, G.R. (ED.), LIBER AMICORUM HONOURING NICOLAS MATEESCO MATTE, BEYOND BOUNDARIES (AU-DELA DES FRONTIERES)(De Daro, 1989).
- BAKER, H., SPACE DEBRIS: LEGAL AND POLICY IMPLICATIONS (Nijhoff, 1989).
- BYERLY, R., JR., SPACE POLICY RECONSIDERED (Westview Press, 1989).
- CLASSEN, C.D., FERNERKUNDUNG UND VOLKERRECHT (Duncker & Humboldt, 1988).
- CONFERENCIA LATINO AMERICANA, TRANSPORTE AEREO INTERNACIONAL Y ACTIVIDADES EN EL ESPACIO ULTRATERRESTRE (Latin American Conference, International Air Transport and Activities in Outer Space) (University of Leiden, 1988).
- EUROSPACE, EUROPEAN SPACE DIRECTORY 1988 (Servig Press, 1988).
- GIPSON, M., GLASS J. & LINDEN, M. (EDS.), SPACE STATION DIRECTORY AND PROGRAM GUIDE (Pasha, 1989).
- HIGBEA, M.E. & VEDDA J.A. (EDS.), PROCEEDINGS OF THE FIRST INTERNATIONAL CONFERENCE ON HYPERSONIC FLIGHT IN THE 21ST CENTURY (University of North Dakota, 1988).
- INTERNATIONAL SATELLITE DIRECTORY (Design Publishers, 1989).
- KINSLEY, A.P. (ED.), SPACE - A NEW ERA: FIFTH NATIONAL SPACE SYMPOSIUM PROCEEDINGS (United States Space Foundation, 1989).
- LATIN AMERICAN CONFERENCE ON INTERNATIONAL AIR TRANSPORT AND ACTIVITIES IN OUTER SPACE: LEGAL, POLITICAL, ECONOMIC AND FINANCIAL ASPECTS (Leiden University, 1989).
- LI, K.L., WORLD WIDE SPACE LAW BIBLIOGRAPHY UPDATE 1987 (De Daro, 1988).
- LI, K.L., WORLD WIDE SPACE LAW BIBLIOGRAPHY UPDATE 1988 (De Daro, 1989).
- MATTE, N.M., ARMS CONTROL AND DISARMAMENT IN OUTER SPACE: TOWARDS OPEN SKIES, VOL. III (Centre for Research in Air and Space Law, 1989).
- PAPP, D.S. & MCINTYRE, J.R. (EDS.), INTERNATIONAL SPACE POLICY: LEGAL, ECONOMIC, AND STRATEGIC OPTIONS FOR THE TWENTIETH CENTURY AND BEYOND (Quorum, 1987).
- REIJNEN, G.C.M. & GRAAFF, W. DE, THE POLLUTION OF OUTER SPACE, IN PARTICULAR OF THE GEOSTATIONARY ORBIT (Nijhoff, 1989).
- REYNOLDS, G.H. & MERGES, R.P., OUTER SPACE: PROBLEMS OF LAW AND POLICY (Westview Press, 1989).
- TORRES, G., SPACE SHUTTLE: THE QUEST CONTINUES (Presidio Press, 1989).
- TRAA-ENGELMAN, H.L. VAN, COMMERCIAL UTILIZATION OF OUTER SPACE: LEGAL ASPECTS (DRUKKERIJ HAVEKA B.V., 1989).
- YOUNG, A.J., LAW AND POLICY IN THE SPACE STATIONS' ERA (Nijhoff, 1989).

B. Articles

- Aftergood, *Towards a Ban on Nuclear Power in Earth Orbit*, 5 SPACE POL'Y 25 (1989).

- Almond, *The Shared Expectations of Legal Order in Outer Space*, 18 CUMB. L. REV. 679 (1989).
- Baker, *Space Debris: Law and Policy in the United States*, 60 U. COLO. L. REV. 55 (1989).
- Bernhardt, Greska & Merry, "Star Wars" versus Star Laws: Does SDI Conform to Outer Space Law?, 15 J. LEGIS. 251 (1989).
- Bleicker, *Freedom of Space Activities and Telecommunications from the Geostationary Orbit*, 15 THES. ACROASIMUM 375 (1987).
- Bring, "Star Wars" and International Law: The Multilateral Dimension, 55 NORD. J. INT'L L. 195 (1986).
- Burton, *Daggers in the Air: Anti-Satellite Weapons and International Law*, 12 FLETCHER F. 143 (1988).
- Craft & Mesgos, *The Emerging Commerce in Space: New National Policy Sets the Tone*, 10 NAT'L L.J. 22 (1988).
- Danilenko, *International Law-Making for Outer Space*, 5 SPACE POL'Y 321 (1989).
- Deliyanni, *La loi applicable en matière de radiodiffusion par satellite d'oeuvres protégées par le droit d'auteur*, 41 REV. INT'LE DROIT COMP. 429 (1989).
- DeSaussure, *Remote Sensing Satellite Regulation by National and International Law*, 15 RUTGERS COMP. & TECH. L.J. 351 (1989).
- Doyle, *Space Law and the Geostationary Orbit: The ITU's WARC-ORB 85 - 88 Concluded*, 17 J. SPACE L. 13 (1989).
- Endsley, *Remote Sensing for Public Safety*, 3 SANTA CLARA COMPUTER & HIGH TECH L.J. 191 (1987).
- Fenema, van, *Space Law of the Future*, 13 AIR LAW 286 (1988).
- Frazer, *Lawyers in Space: The Next Generation. When Should Lawyers be Sent into Orbit? Soon!*, 15 BARRISTER 4 (1988).
- Freegard, *Direct Broadcasting by Satellite (DBS): The Implications for Copyright*, 13 COLUM. J.L. & ARTS 77 (1988).
- Gaggero, *Developing Countries and Space*, 5 SPACE POL'Y 107 (1989).
- Jasani & Larsson, *Security Implications of Remote Sensing*, 4 SPACE POL'Y 46 (1988).
- Johnson, *The Impact of International Law and Treaty Obligations on United States Military Activities in Space*, 3 HIGH TECH. L.J. 33 (1988).
- Johnson-Freese, *Changing Patterns of International Cooperation in Space*, 4 SPACE POL'Y 60 (1988).
- Lafferranderie, *La Troisième Réunion du Conseil de L'Agence Spatiale Européenne Réuni au Niveau Ministeriel*, 41 REV. FR. DR. AER. 401 (1987).
- Lust, *European Cooperation in Space*, ESA BULL. (No. 58, 1989), at 14.
- Mennon, *Problems and Prospects of Preserving Outer Space from Arms Race Escalation*, 55 NORD. J. INT'L L. 210 (1987).

- Mennon, *Problems and Prospects of Preserving Outer Space from Arms Race Escalation, Multilateral and Bilateral Efforts*, 21 LAW/TECH. (Third Quarter, 1988), at 50.
- Meredith, *"Star Wars" and SDI - An International Legal Perspective*, 56 NORD. J. INT'L L. 205 (1987).
- Noorden, von and Dann, *Land Mobile Satellite Communications: A Further Development in International Space Law*, 17 J. SPACE L. 1 (1989).
- Oosterlinck, *The Intergovernmental Space Station Agreement and Intellectual Property Rights*, 17 J. SPACE L. 23 (1989).
- Priyatna, *The Outer Space Treaty and the Geostationary Orbit*, 12 ANNALS AIR & SPACE L. 131 (1987).
- Robinson, *Re-examining Our Constitutional Heritage: A Declaration of First Principles for the Governance of Outer Space Societies*, 3 HIGH TECH L.J. 81 (1988).
- Rosen, Allred, Eggeman & Knapp, *Aviation and Space Law: Annual Survey*, 24 TORT & INS. L.J. 194 (1989).
- Venizelos, *La Constitution grecque face au nouveau paysage audiovisuel: Radiophonie locale, télédistribution, télédiffusion par satellite*, 41 REV. INT'LE DROIT COMP. 323 (1989).
- Vitt, *Space Debris*, 5 SPACE POL'Y 129 (1989).
- Wiehl, *Smooth Countdown for Space Law Growth*, 135 CHI. DAILY L. BULL. 1 (1989).
- Wise & Andrus, *Current Literature on Aerospace Law*, 54 J. AIR L. & COM. 673 (1988).

Reports

- Frantzen, B. von, *Deutsche Gesellschaft für Luft- und Raumfahrt (DGLR) und Deutsche Vereinigung für Internationales Recht (DVIR), Gemeinsame Sitzung der Ausschüsse für Luft- und Weltraumrecht, Köln, 24. Mai 1989*, 38 ZLW 227 (1989).
- Gorove, K., *Developments in the International Law of Telecommunications*, 17 J. SPACE L. 47 (1989).
- Iwai, *Review of the Work of the United Nations Scientific and Technical Sub-Committee on Outer Space in February-March 1989*, 17 J. SPACE L. 37 (1989).
- Szasz, *The 28th Session of the Legal Sub-Committee of the UN Committee on Outer Space, 20 March - 7 April 1989*, 17 J. SPACE L. 41 (1989).

Comments

- Acceptance of Prior Consent as a Means of Regulating Direct Broadcast Satellites*, 3 EMORY J. INT'L DIS. RES. 99 (1988).
- Fought, *Legal Aspects of Commercialization of Space Transportation Systems*, 3 HIGH TECH. L.J. 99 (1988).
- Gál, *"Threat or Use of Force" - Observation to Article 2 of the U.N. Charter and Article III of the Outer Space Treaty*, 17 J. SPACE L. 54 (1989).

- Hennessey, *Liability for Damage Caused by the Accidental Operation of a Strategic Defense Initiative System*, 21 CORNELL INT'L L.J. 317 (1988).
Law and the Extra-terrestrial, 31 ADVOCATE 12 (1988).
- Pucciarelli, *The Case For a Federal Common Law of Space*, 33 N.Y.L. SCH. L. REV. 509 (1988).
- Resolution of Legal Issues Confronting the International Space Station Project: A Step Forward in the Development of Space Law*, 29 VA. L. REV. 745 (1989).
- Satellite Piracy in the Great White North: Can U.S. Broadcasters Protect Themselves Against Unauthorized Retransmission of their Signals by Canadian Systems?*, 15 SYRACUSE J. INT'L L. & COM. 103 (1988).
- Smith, *The Space WARC Continues*, 83 AM. J. INT'L L. 596 (1989).
- Wirin, *The Advent of Commercial Space: Comments on a Joint Venture Agreement*, 17 J. SPACE L. 61 (1989).

Book Reviews/Notices

- BRUCE, ROBERT R./CUNARD, JEFFREY P./DIRECTOR, MARK D., *THE TELECOM MOSIAC*, 17 J. SPACE L. 79 (1989).
- CHAO, C.C./HORNELL, K.E./SHAHROKHI (EDS.), *COMMERCIAL OPPORTUNITIES IN SPACE*, 17 J. SPACE L. 82 (1989).
- COURTEIX, S./MANIN A. (EDS.), *LA COOPÉRATION SPATIALE EUROPÉENNE* (Reijnen), 38 ZLW 197 (1989).
- DANILENKO, G.M., *OBICHAI V SOVREMENNOM MEZHDNARODNOM PRAVE (CUSTOM IN CONTEMPORARY INTERNATIONAL LAW)* (Hazard) 83 AM. J. INT'L L. 640 (1989).
- DUTHEIL DE LA ROCHERE AND OTHERS, *DROIT DE L'ESPACE* (S. Gorove), 17 J. SPACE L. 78 (1989).
- KANTOR, L. YA, *HANDBOOK OF SATELLITE TELECOMMUNICATIONS AND BROADCASTING*, 17 J. SPACE L. 81 (1989).
- LAWRENCE, ROBERT M., *STRATEGIC DEFENSE INITIATIVE - BIBLIOGRAPHY AND RESEARCH GUIDE* (Konstantinov), 38 ZLW 198 (1989).
- LI, KUO LEE, *WORLD WIDE SPACE LAW BIBLIOGRAPHY, Vol. II*, 17 J. SPACE L. 82 (1989).
- LUTHER, SARA E., *THE UNITED STATES AND THE DIRECT BROADCAST SATELLITE*, 17 J. SPACE L. 80 (1989).
- MATTE, NICOLAS MATEESCO/JAKHU, RAM S., *LAW OF INTERNATIONAL TELECOMMUNICATIONS IN CANADA* (Bueckling), 38 ZLW 195 (1989).
- PEEBLES, CURTIS, *GUARDIANS - STRATEGIC RECONNAISSANCE SATELLITES* (Vitt), 38 ZLW 310 (1989).
- REINEN, G.C.M./GRAAFF, W. DE, *THE POLLUTION IN OUTER SPACE, IN PARTICULAR OF THE GEOSTATIONARY ORBIT* (Vitt), 38 ZLW 195 (1989).
- SHARMA, G.N., *SATELLITE COMMUNICATIONS AND OUTER SPACE: REGULATORY ASPECTS*, 5 SPACE POL'Y 176 (1989).
- SHARMA, G.N., *SATELLITE COMMUNICATIONS AND OUTER SPACE: REGULATORY ASPECTS* 17 J. SPACE L. 181 (1989).

- SIPRI, WORLD ARMAMENT AND DISARMAMENT, 5 SPACE POL'Y 88 (1989).
- SNOW, M.S., THE INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION (INTELSAT) - ECONOMIC AND INSTITUTIONAL CHALLENGES FACING AN INTERNATIONAL COMMUNITY (Reijnen), 38 ZLW 197 (1989).
- UNITED STATES SPACE FOUNDATION, SPACE EXPECTATIONS (Bueckling), 38 ZLW 196 (1989).
- TRAA-ENGELMAN, H. L. VAN, COMMERCIAL UTILIZATION OF OUTER SPACE - LEGAL ASPECTS (Bueckling), 38 ZLW 313 (1989).
- WELCK, STEFAN FRHR, VON, SATELLITEN IN DER INTERNATIONALEN POLITIK (Focke), 38 ZLW 312 (1989).
- YOUNG, ANDREW J., LAW AND POLICY IN THE SPACE STATIONS' ERA (Schmidt-Tedd), 38 ZLW 311 (1989).

C. Official Publications

Agreements

- Agreement on Cooperation in the Detailed Design, Development, Operation, and Utilization of the Permanently Manned Civil Space Station, with Annex, Sept. 29, 1988 (not in force for the U.S).
Ratification deposited: Denmark, July 5, 1989; Norway, Feb. 9, 1989.
- Agreement Relating to the International Telecommunications Satellite Organization (INTELSAT), with Annexes, Washington, D.C., Aug. 20, 1971, entered into force Feb. 12, 1973, T.I.A.S. No. 7532.
Accessions Deposited: Nepal, Mar. 1, 1989; Zimbabwe, Mar. 15, 1989.
- Amendments to the Convention and Operating Agreement on the International Maritime Satellite Organization (INMARSAT), Sept. 3, 1976, adopted Oct. 16, 1985, entered into force Oct. 13, 1989, T.I.A.S. No. 9605.
Acceptances deposited: New Zealand, Apr. 28, 1989; Gabon, Mar. 15, 1989; Oman, Nov. 28, 1988; Belgium, June 15, 1989; Egypt, June 7, 1989 (Opt. Agrt.).
Accessions Deposited: Czechoslovakia, Dec. 8, 1988; Lybia, May 16, 1989.
- Convention on the International Maritime Satellite Organization (INMARSAT) with Annex, Sept. 3, 1976, entered into force July 16, 1979, T.I.A.S. No. 9605.
Accessions Deposited: Czechoslovakia, Dec. 8, 1988; Switzerland, May 17, 1989.
- Convention on the Protection of the Ozone Layer, with Annexes, Mar. 22, 1985, entered into force Sept. 22, 1988, (Senate) Treaty Doc. 99-9.
Ratifications deposited: Burkina Faso, Mar. 30, 1989; Peru, Apr. 7, 1989; Greece, Dec. 29, 1988.

- Accession deposited: Jordan, May 31, 1989; German Dem. Rep., Jan. 25, 1989; Liechtenstein, Feb. 8, 1989; Panama, Feb. 13, 1989; Uruguay, Feb. 27, 1989; Ghana, July 24, 1989; Thailand, June 30, 1989.
- Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, entered into force Sept. 15, 1976, T.I.A.S. No. 8480.
- Notification of Succession Deposited: Antigua and Barbuda, Dec. 13, 1988 (effective Nov. 1, 1981).
- Memorandum of Agreement Between the Government of the United States of America and the Government of the People's Republic of China Regarding International Trade in Commercial Launch Services, Jan. 26, 1989, entered into force Mar. 16, 1989.
- Memorandum of Agreement on Satellite Technology Safeguards Between the Governments of the United States of America and the People's Republic of China, Dec. 17, 1988, entered into force Mar. 16, 1989.
- Memorandum of Agreement on Liability for Satellite Launches Between the Government of the United States of America and the Government of the People's Republic of China, Dec. 17, 1988, entered into force Mar. 16, 1989.
- Memorandum of Understanding Between the United States National Aeronautics and Space Administration and the Government of Japan on Cooperation in the Detailed Design, Development, Operation and Utilization of the Permanently Manned Civil Space Station, Mar. 14, 1989, enters into force upon written notification by each party of the completion of all necessary procedures for entry into force.
- Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, entered into force Jan. 1, 1989, (Senate) Treaty Doc. 100-10. Proclaimed by the President: Mar. 9, 1989.
- Ratifications deposited: Australia, May 19, 1989; Maldives, May 16, 1989; Austria, May 3, 1989; Ghana, Mar. 8, 1989; Panama, Mar. 3, 1989; Venezuela, Feb. 6, 1989; Malta, Dec. 29, 1988.
- Accession deposited: Jordan, May 31, 1989; Hungary, Apr. 20, 1989; Singapore, Jan. 5, 1989; German Dem. Rep., Jan. 25, 1989; Liechtenstein, Feb. 8, 1989.
- Operating Agreement on the International Maritime Satellite Organization (INMARSAT), with Annex, Sept. 3, 1976, entered into force July 16, 1979, T.I.A.S. No. 9605.
- Signature: Czechoslovakia, Dec. 8, 1988.
- Operating Agreement Relating to the International Telecommunications Satellite Organization (INTELSAT), with Annex, Aug. 20, 1971, entered into force Feb. 12, 1973, T.I.A.S. No. 7532.
- Signatures: Nepal Telecommunications Corp., Mar. 1, 1989; Government of Zimbabwe, Mar. 15, 1989.
- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial

Bodies. Done at Washington, London, and Moscow, Jan. 27, 1967, entered into force Oct. 10, 1967, T.I.A.S. No. 6347.
Ratification deposited: Togo, June 26, 1989.

Department of Commerce

A GUIDE TO TELECOMMUNICATIONS MARKETS IN LATIN AMERICA (1989).

Department of Defense

THE SATELLITE ALMANAC USER'S GUIDE (1989).

WORKING GROUP ON TECHNOLOGY, RECOMMENDED CHANGES IN U.S. MILITARY SPACE POLICIES AND PROGRAMS: A PAPER (1988).

ESA

EUROPEAN SPACE - ON COURSE FOR THE 21ST CENTURY (1987).

INMARSAT

ANNUAL REVIEW 1988/89 (1989).

INTELSAT

BRIDGING THE GAP - A GUIDE TO TELECOMMUNICATIONS AND DEVELOPMENT (1989).

DOUGAN, D.L., NEW TELECOMMUNICATIONS SERVICES: LET'S NOT STACK THE DECK AGAINST THEM (1988).

REPORT 1987-1988 (1988).

ITU

SOCIO-ECONOMIC BENEFITS OF IMPROVED TELECOMMUNICATIONS IN DEVELOPING COUNTRIES (1988).

NASA

ASTRONAUT FACT BOOK (1989).

United Nations

EDUCATION, TRAINING, RESEARCH AND FELLOWSHIP OPPORTUNITIES IN SPACE SCIENCE AND TECHNOLOGY AND ITS APPLICATIONS: A DIRECTORY (1989).

United States Congress

AN ACT TO AMEND AND EXTEND THE AUTHORIZATION OF APPROPRIATIONS FOR PUBLIC BROADCASTING AND FOR OTHER PURPOSES (1988).

- AN ACT TO AUTHORIZE APPROPRIATIONS TO THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION FOR RESEARCH AND DEVELOPMENT, SPACE FLIGHT, CONTROL AND DATA COMMUNICATIONS, CONSTRUCTION OF FACILITIES, AND RESEARCH AND PROGRAM MANAGEMENT, AND FOR OTHER PURPOSES (1988).
- AN ACT TO PROVIDE AUTHORIZATION OF APPROPRIATIONS FOR ACTIVITIES OF THE NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION (1988).
- COMMERCIAL SPACE LAUNCH ACT AMENDMENTS OF 1988 (1988).
- HOUSE COMM. ON ENERGY AND COMMERCE, PUBLIC TELECOMMUNICATIONS ACT OF 1988: REPORT TOGETHER WITH ADDITIONAL AND SUPPLEMENTAL VIEWS TO ACCOMPANY H.R. 4118 (INCLUDING COST ESTIMATE OF THE CONGRESSIONAL BUDGET OFFICE), 100TH CONG., 1ST SESS. (1988).
- House Comm. on Energy and Commerce, *Satellite Home Viewer Copyright Act: Hearing Before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce on H.R. 2848*, 100th Cong., 1st Sess. (Sept. 23, 1988).
- House Comm. on Energy and Commerce, *Satellite Scrambling: Hearing Before the Subcomm. on Telecommunications and Finance of the Comm. on Energy and Commerce on H.R. 1885*, 100th Cong., 1st Sess. (1988).
- House Comm. on Foreign Affairs, *Nuclear Testing: Arms Control Opportunities: Hearing Before the Subcomm. on Arms Control, International Security, and Science*, 100th Cong., 2d Sess. (June 28, 1988).
- House Comm. on the Judiciary, *Competition in the Telecommunications Industry: Hearing Before the Subcomm. on Monopolies and Commercial Law of the Comm. on the Judiciary on H.R. 2030*, 100th Cong., 1st Sess. (April 29, 1987).
- House Comm. on the Judiciary, *Satellite Home Viewer Copyright Act: Hearings before the Subcomm. on Courts, Civil Liberties, and the Administration of Justice of the Comm. on the Judiciary on H.R. 2848*, 100th Cong., 1st & 2d Sess. (Nov. 19, 1987 & Jan. 27, 1988).
- House Comm. on Science, Space, and Technology, *1989 NASA Authorization: Hearings before the Subcomm. on Space Science, and Application of the Comm. on Science, Space and Technology*, 100th Cong., 2d Sess. (Mar. 3, 8-10, 22-24, 29-31, 1988).
- House Comm. on Science, Space, and Technology, *The Administration's Decision to License the Chinese Long March Launch Vehicle: Hearings before the Comm. on Science, Space, and Technology*, 100th Cong., 2d Sess. (Sept. 23 & 27, 1988).
- House Comm. on Science, Space, and Technology, *Review of Major Space Program Studies and Recommendations made to Rush Transition Team: Hearings before the Subcomm. on Space Science and Applications of the Comm. on Science, Space and Technology*, 101st Cong., 1st Sess. (Feb. 8-9, 1989).
- House Comm. on Science, Space and Technology, Subcomm. on Space Science and Applications, *Future Goals in Space: Hearings before*

- the Subcomm. on Space Science and Applications of the Comm. on Science, Space and Technology*, 100th Cong., 2d Sess. (Feb. 1 & 5, 1988).
- HOUSE COMM. ON SCIENCE, SPACE, AND TECHNOLOGY, SUMMARY OF ACTIVITIES OF THE COMM. ON SCIENCE, SPACE, AND TECHNOLOGY (1989).
- NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION AUTHORIZATION (1988).
- SENATE COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION NATIONAL AERONAUTICS AND SPACE ADMINISTRATION AUTHORIZATION ACT, 1989: REPORT OF THE SENATE COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION ON S. 2209 (1989).
- Senate Comm. on Commerce, Science, and Transportation, *Public Telecommunications Act of 1988: Hearing before the Subcomm. on Communications of the Committee on Commerce, Science, and Transportation on S. 2114*, 100th Cong., 2d Sess. (Mar. 15, 1988).
- SENATE COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION, PUBLIC TELECOMMUNICATIONS ACT OF 1988: REPORT OF THE SENATE COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION TOGETHER WITH ADDITIONAL VIEWS ON S. 2114 (1988).
- SENATE COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION, REPORT ON THE ACTIVITIES OF COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION (1989).
- Senate Comm. on Commerce, Science, and Transportation, *Results of the Space Shuttle Discovery Mission: Hearing before the Comm. on Commerce, Science, and Transportation*, 100th Cong., 2d Sess. (Oct. 13, 1988).
- SENATE COMM. ON COMMERCE, SCIENCE, AND TRANSPORTATION SOVIET SPACE PROGRAMS: 1981-87 (1989).
- Senate Comm. on Energy and Natural Resources, *Cosmos 1900 and the Future of Space Nuclear Power: Hearing before the Comm. on Energy and Natural Resources*, 100th Cong., 2d Sess. (Sept. 13, 1988).
- Senate Comm. on Energy and Natural Resources, *Advanced Reactor Development Program: Hearing before the Subcomm. on Energy Research and Development of the Comm. on Energy and Natural Resources*, 100th Cong., 2d Sess. (May 24, 1988).
- Senate Comm. on Foreign Relations, *Test Ban Issues: Hearing of the Comm. on Foreign Relations*, 100th Cong., 2d Sess. (Oct. 6, 1988).

D. Miscellaneous

- BITTLINGER, H., HISTORY OF THE INSTITUTE OF AIR AND SPACE LAW OF THE UNIVERSITY OF COLOGNE (University of Cologne, 1989).
- BURNS, W.F., AN OVERVIEW OF U.S. ARMS CONTROL OBJECTIVES (1989).
- SHULTZ, G.P., THE ADMINISTRATION'S ARMS CONTROL LEGACY (1988).
- SOVIET COSMONAUTICS: QUESTIONS AND ANSWERS (NOVOSTI, 1988).

Errata in Vol. 17, No. 1 (1989):

In Vol. 17, No. 1 (1989) on p. 2, in the first complete paragraph, the last two sentences should read:

The amendments will enable INMARSAT to respond both to existing and to predicted future demands for land mobile *satellite communications*. *The use of a single space segment for all types of mobile communications* - maritime, aeronautical and land mobile - will have considerable operational and economic advantages. (Omitted words in italics).

On p. 5, in the second complete paragraph, eighth line, for "predictable" read "practicable".

On p. 6, the two sentences immediately preceding footnote 27 should read:

"In this regard", the Council reported, "the Director General is assisting a group of European Signatories in the preparation of a trials programme, to investigate the technical suitability and potential market acceptance for such a land mobile-satellite service. *In view of the future scope of land mobile-satellite services*, and the fact that INMARSAT has obtained wide experience and facilities in the provision of mobile-satellite services, the Council recognized that the Assembly might wish to consider the enhancement of INMARSAT's institutional competence to this effect." (Omitted words in italics).

On p. 6, in the subparagraph immediately preceding footnote 29, after "INMARSAT" insert "Convention and Operating Agreement."

On p. 9, in the first line of the final paragraph, after "noted" insert "that".

CURRENT DOCUMENTS *

AMENDMENTS TO THE CONVENTION ON THE INTERNATIONAL MARITIME SATELLITE ORGANIZATION (INMARSAT)

PREAMBLE

The third paragraph of the Preamble is replaced by the following text:

TAKING INTO ACCOUNT that world trade is dependent upon transportation by sea, air and on land,

The seventh paragraph of the Preamble is replaced by the following text:

AFFIRMING that a maritime satellite system shall also be open for aeronautical and land mobile communications and communications on waters not part of the marine environment for the benefit of all nations,

ARTICLE 1 Definitions

Article 1, paragraph (f) is replaced by the following text:

- (f) "Ship" means a vessel of any type operating in the marine environment or on waters not part of the marine environment. It includes inter alia dynamically supported craft, submersibles, floating craft and platforms not permanently moored.

In Article 1, the following new paragraphs (i) and (j) are added:

- (i) "Mobile earth station" means an earth station in the mobile-satellite service intended to be used while in motion or during halts at unspecified points.
- (j) "Land earth station" means an earth station in the fixed-satellite service or, in some cases, in the mobile-satellite service, located at a specified fixed point or within a specified area on land to provide a feeder link for the mobile-satellite service.

ARTICLE 3 Purpose

Article 3, paragraphs (1) and (2) are replaced by the following text:

- (1) The purpose of the Organization is to make provision for the space segment necessary for improving maritime communications and, as practicable, aeronautical and land mobile communications and communications on waters not part of the marine environment, thereby assisting in improving communications for distress and safety of life, communications for air traffic services, the efficiency and management of transportation by sea, air and on land,

* Taken from INMARSAT, ASSEMBLY/b/16,4,2,7 and Annexes IV to XI.

maritime, aeronautical and other mobile public correspondence services and radiodetermination capabilities.

(2) The Organization shall seek to serve all areas where there is need for maritime, aeronautical and other mobile communications.

ARTICLE 7 Access to Space Segment

Article 7, paragraphs (1), (2) and (3) are replaced by the following text:

(1) The INMARSAT space segment shall be open for use by ships and aircraft of all nations and by mobile earth stations on land on conditions to be determined by the Council. In determining such conditions, the Council shall not discriminate among ships or aircraft or mobile earth stations on land on the basis of nationality.

(2) The Council may permit access to the INMARSAT space segment by earth stations located on structures operating in the marine environment other than ships and by mobile earth stations at fixed locations on land, if and as long as the operation of such earth stations would not have a significantly adverse effect on the provision of mobile-satellite services.

(3) Land earth stations communicating via the INMARSAT space segment shall be located on land territory under the jurisdiction of a Party and shall be wholly owned by Parties or entities subject to their jurisdiction. The Council may authorize otherwise if it finds this to be in the interests of the Organization.

In Article 7, the following paragraph (4) is added:

(4) Use of the INMARSAT space segment by mobile earth stations within land territory under the jurisdiction of a State shall be subject to the regulations governing radiocommunications of that State, and shall not be detrimental to that State's security.

ARTICLE 12 Assembly - Functions

Article 12, sub-paragraph (1)(c) is replaced by the following text:

- (c) Authorize, on the recommendation of the Council, the establishment of additional space segment facilities the special or primary purpose of which is to provide radiodetermination, distress or safety services. However, the space segment facilities established to provide maritime, aeronautical and other mobile public correspondence services can be used for telecommunications for distress, safety and radiodetermination purposes without such authorization.

ARTICLE 15 Council - Functions

Article 15, paragraphs (a), (c) and (h) are replaced by the following text:

- (a) Determination of maritime, aeronautical and other mobile satellite telecommunications requirements and adoption of policies, plans, programmes, procedures and measures for the design, development, construction, establishment, acquisition by purchase or lease, operation, maintenance and utilization of the INMARSAT space segment, including the procurement of any necessary launch services to meet such requirements.
- (c) Adoption of criteria and procedures for approval of land earth stations, mobile earth stations, and earth stations on structures in the marine environment for access to the INMARSAT space segment and for verification and monitoring of performance of earth stations having access to and utilization of the INMARSAT space segment. For mobile earth stations, the criteria should be in sufficient detail for use by national licensing authorities, at their discretion, for type-approval purposes.
- (h) Determination of arrangements for consultation on a continuing basis with bodies recognized by the Council as representing shipowners, aircraft and land transport operators, maritime, aeronautical and land transport personnel and other users of maritime, aeronautical and other mobile telecommunications.

ARTICLE 21 Inventions and Technical Information

Article 21, sub-paragraphs 2(b) and 7(b)(i) are replaced by the following text:

- (2) (b) The right to disclose and to have disclosed to Parties and Signatories and others within the jurisdiction of any Party such inventions and technical information, and to use and to authorize and to have authorized Parties and Signatories and such others to use such invention and technical information without payment in connexion with the INMARSAT space segment and any mobile earth station or land earth station operating in conjunction therewith.
- (7) (b) (i) Without payment in connexion with the INMARSAT space segment or any land earth station or mobile earth station operating in conjunction therewith;

ARTICLE 32 Signature and Ratification

Article 32, paragraph (3) is replaced by the following text:

- (3) On becoming a Party to this Convention, or at any time thereafter, a State may declare, by written notification to the Depositary, to which Registers of ships, to which aircraft and mobile earth stations on land operating under its authority, and to which land earth stations under its jurisdiction, the Convention shall apply.

AMENDMENTS TO THE OPERATING AGREEMENT ON THE
INTERNATIONAL MARITIME SATELLITE ORGANIZATION (INMARSAT)

ARTICLE V Investment Shares

Article V, paragraph (2) is replaced by the following text:

(2) For the purpose of determining investment shares, utilization in both directions shall be divided into two equal parts, a mobile earth station part and a land part. The part associated with the ship or aircraft or mobile earth station on land where the traffic originates or terminates shall be attributed to the Signatory of the Party under whose authority the ship or aircraft or mobile earth station on land is operating. The part associated with the land territory where the traffic originates or terminates shall be attributed to the Signatory of the Party in whose territory the traffic originates or terminates. However, where, for any Signatory, the ratio of the mobile earth station parts to the land parts exceeds 20:1, that Signatory shall, upon application to the Council, be attributed a utilization equivalent to twice the land part or an investment share of 0.1 per cent, whichever is higher. Structures operating in the marine environment, for which access to the INMARSAT space segment has been permitted by the Council, shall be considered as ships for the purpose of this paragraph.

ARTICLE XIV Earth Station Approval

Article XIV, paragraph (2) is replaced by the following text:

(2) Any application for such approval shall be submitted to the Organization by the Signatory of the Party in whose territory the land earth station is or will be located, or by the Party or the Signatory of the Party under whose authority the mobile earth station or the earth station on a structure operating in the marine environment is licensed or, with respect to land earth stations and mobile earth stations located in a territory or on a ship or an aircraft or an earth station on a structure operating in the marine environment not under the jurisdiction of a Party, by an authorized telecommunications entity.

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 Baker, Howard A., *Space Debris: Legal and Policy Implications*, 189.
 Bruce, Robert R., Cunard, Jeffrey P. and Director, Mark D., *The Telecom Mosaic*, 79-80.
 Chao, C.C., Horwell, K.E. and Shahrokhi, *Commercial Opportunities in Space*, 82.
 Dutheil de la Rochère, Jacqueline, *Droit de l'espace*, 78-79.
 Eurosace, European Space Directory 1988, 190.
 Gabrynowicz, J.I., 185-186.
 Kantor, L. Ya, *Handbook of Satellite Telecommunications and Broadcasting*, 81-82.
 Kinsley, Allison P. (Ed.) *Space - A New Era: Fifth National Space Symposium Proceedings, 1986-1987*.
 Li, Kuo Lee, *Worldwide Space Law Bibliography*, Vol. II, 82.
 Li, Kuo Lee, *Worldwide Space Law Bibliography Update 1987 and Update 1988*, 190.
 Luther, Sara F., *The United States and the Direct Broadcast Satellite*, 80-81.
 Papp, Daniel S. and McIntyre John R. (Eds.), *International Space Policy: Legal, Economic, and Strategic Options for the Twentieth Century and Beyond*, 185-186.
 Reijnen, C.M. and Graaff W. de, *The Pollution of Outer Space, In Particular of the Geostationary Orbit*, 188-189.
 Sharma, G.N., *Satellite Communications and Outer Space: Regulatory Aspects*, 81.
 Torres, George, *Space Shuttle: The Quest Continues*, 189-190.
 Traa-Engelman, Hanneke Louise van, *Commercial Utilization of Outer Space: Legal Aspects*, 187-188.

- Bourély, Michel, *Report on the Colloquium on Manned Space Stations Legal Issues*, 180-82.
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 2. Amendments to the Convention on the International Maritime Satellite Organization (INMARSAT), 201-03.
 3. Amendments to the Operating Agreement on the International Maritime Satellite Organization (INMARSAT), 204.
- Dann, Phillip, and Noorden, Dr. Wolf D. von, *Land Mobile Satellite Communications: A Further Development in International Space Law* (Part I), 1-12, (Part II), 103-13.
- Diederiks-Verschoor, I. H. Ph., *Implications of Commercial Activities in Outer Space, Especially for the Developing Countries*, 115-27. *International Colloquium on the Law of Outer Space*, Oct. 9-14, 1989, 149-62.
- Doyle, Stephen E., *Space Law and the Geostationary Orbit: The ITU's WARC-ORB 85-88 Concluded*, 13-21.
- Erler, J. "Space Without Weapons," *Symposium Held at McGill University*, 177-80.
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- Gorove, Katherine M, *Developments in the International Law of Telecommunications*, 47-54; "The Law and Outer Space," *First Annual Symposium*, Sept. 8-9, 1989, 172-75.
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- Jasentuliyana, N., *Article I of the Outer Space Treaty Revisited*, 129-44, *Review of the Work of the United Nations Committee on the Peaceful Uses of Outer Space in 1989*, 145-49.
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- Meredith, Pamela, *Status of the "Patents in Space" Legislation in Congress, October 1989*, 163-67.
- Ministry of State for Science and Technology (MOSST) for the Government of Canada, 24-25.
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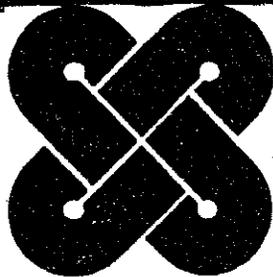
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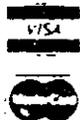
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